Components

ARMSTRONG

Series 400 & 500

421/521 Stereo Amplifier

423/523 AM-FM Tuner

424/524 FM Tuner

425/525 FM Stereo Tuner amplifier

426/526 AM-FM Stereo Tuner amplifier

M4/M8 Stereo Radio Decoder

TRANSISTORS

Circuit Ref.	Type	Typical voltages —volts (Positive earth) Collector	Base	Emitter
TR1	AF106	12	1·7	1·4
TR2	AF115	12	2·4	2·2
TR3	AF116	9·8	3	2·8
TR4	AF116	9·8	3	2·8
TR5	AF116	9·8	3	2·8
*TR6	AC139	2·3	0·02	0
TR7	AF116	7·2	2·3	2·1
TR8	AC128	7	1·4	1·3
TR9	AC128	3·5	0·6	0·5
TR10	AC128	7	0·02	0
TR11	AF116	6	1·3	1·1
TR12	AF116	6	1·3	1·1
†TR13	BC109 or ME4102	0·02	11	12
TR14	BSV44A	50	0·02	0
TR14A	AC128	12	0·02	0 M4 only
TR14B	BSV44A	50	0·02	0 M8 only
TR15	AF116	5	1·8	1·5
TR16	AF117	9·7	1·5	1·3
TR17	AF116	8·3	2·2	2
TR18	AF116	10	1·6	1·4
TR19	BC109 or ME4102	5	14·3	14·5
TR20	AC191 5	21	8	7·5

* Quieting control anticlockwise.
† Stereo indicator may light when measuring base volts.

Circuit Ref.	Type	Typical voltages —volts (Positive earth) Collector	Base	Emitter
TR21	AC191 5	17	8·2	8
TR22	XK1112	8·5	0·52	0·12
TR22A	AC191 7	8·5	0·52	0·12 A14 only
TR22B	XK1112	8·5	0·52	0·12 A15 only
TR23	AC139H	32	8·5	8
TR24	AC139Z	50	25·7	25·5
TR25	AL102	50	25·5	25
TR26	AC139Z	25	0·4	0·27
TR27	AL102	25	0·27	0·02
TR28	AC139H	51	12·2	12
TR29	AL102	70	50·5	50
TR30	AC139H	70	51	50·5
TR31	ME4102	2·7	5·3	5·5
TR32	AC134–AC1914	7·5	2·7	2·6
TR33	BSV44A	32	8·5	8
TR34	BSV44A	50	25·7	25·5
TR36	BSV44A	25	0·4	0·27

Notes:

1. Voltages must be measured under no signal conditions with volume control at minimum.
2. Readings of base voltages may be affected by the meter used.
3. These typical readings assume that the HT is correctly set at 50 volts ± 1 volt.
4. Transistors TR19 to TR27 inclusive are duplicated in each channel.
5. All transistors shown above, except BC 109, are specially selected types and should be obtained from Armstrong Audio Ltd.
   When ordering selected transistors please quote circuit reference.

COILS AND TRANSFORMERS

Part number	Circuit ref.	DC resistance ohms	
RFC1	L1	·75	
RFC2	L2	·75	
FTA4	L3	·2	
	L4	·1	
RFC3	L5	—	
FRO1	L6	—	
FRO1	L7	—	
FRO1	L8	—	
RFC2	L9	—	
IFT24	L10	1·3	
	L11	·3	
IFT20	L12	·3	
	L13	·3	
IFT20	L14	·3	
	L15	·3	
IFT20	L16	·3	
	L17	·3	
	L18	·5	
RDT3	L19	—	
	L20	·55	
ED1	L22	90	(tapped at 3·2 ohms)
ED1	L23	90	(tapped at 3·2 ohms)
ED2	L24	23	(tapped at 2·5 ohms)
	L25	·9	(centre tapped)
IFR	L26	—	
MLA1	L27	3·5	
	L28	33	
	L28a	1·8	
MLR1	L29	2·6	
	L30	3·7	
	L31	34	
	L32	1·4	
ML01	L33	2·3	
	L34	6·4	
	L35	0·5	
	L36	10·5	
IFT21	L37	4·5	
	L38	4·5	
IFT21	L39	4·5	
	L40	4·5	
IFT22	L41	6·4	
	L42	*	

* 100 ohms, positive of meter to earth 100K, negative of meter to earth (D7 is inside can).

Part number	Circuit ref.	DC resistance ohms	
MAINS TRANSFORMER	L43	1·6	
	L44	11	
	L45	11	
	L46	0·6	(centre tapped)
	L47	60	
	L48	60	

DIODES

D1–D7 inclusive OA79 or AA119
D8 Zener Diode LMX12A or IN4164
D9–D13 inclusive DD003 or PL4003
D14 Zener diode LMZX12A or IN4164
D15 and 16 DD003 or PL4003

POTENTIOMETERS

VR1 50K LIN (FM quieting)
VH2 1K pre-set (adjust meter)
VR3 100K–100K LIN (bass)
VR4 100K–100K LIN (treble)
VR5 20K 95%–20K 5% (balance)
VR6 100K–100K S/LOG (volume)
VR7 8·2K pre-set
VR8 1K pre-set (adjust HT volts)
VR9 1K LIN pre-set (output level)

FUSES

F1 1A (20 mm×5 mm)
F2 1A (20 mm×5 mm)
F3 400 mA anti-surge (20 mm×5 mm)
(800 mA for 105–125V AC input)
F4 100 mA anti-surge (20 mm×5 mm)

PILOT LAMPS

(200 mA for 105–125V AC input)

	423 & 424			*523 & 524*		
P1	12V	0·1A	MES	6·5V	1W	LES
P2	12V	0·1A	MES	6·5V	1W	LES
P3	12V	0·1A	MES	12V	1·5W	LES
P4	10V	0·05A	MES	10V	0·05A	MES

	425 & 426		*525 & 526*	
P1	0·1A	12V	0·1A	6·5V
P2	0·1A	12V	0·1A	6·5V
P3	0·1A	12V	0·1A	12V
P4	0·05A	10V	0·05A	50V

Note:
1 Higher current lamp must not be used for P4.
2 On 523, 524, 525 & 526; P1 & P2 are wired in series.

RESISTORS & CAPACITORS

Circuit Ref.	Value
1	68pf
2	68pf
3	68pf
4	68pf
5	0·1mfd
6	68K
7	0·1mfd
8	47pf
9	15K
10	560 ohm
11	20pf
12	22·5pf
13	22·5pf
14	20pf
15	0·01mfd
16	2·7K
17	10K
18	20pf
19	5pf
20	5pf
21	22·5pf
22	20pf
23	100pf
24	1·5K
25	15pf
26	100 ohm
27	33K
28	0·1mfd
29	18K
30	1K
31	270 ohm
32	200pf
33	1K
34	200pf
35	0·01mfd
36	0·1mfd
37	18K
38	0·01mfd
39	33K
40	1K
41	0·01mfd
42	270 ohm
43	200pf
44	100 ohm
45	200pf
46	33K
47	0·1mfd
48	18K
49	0·01mfd
50	1K
51	0·01mfd
52	100 ohm
53	200pf
54	270 ohm
55	200pf
56	250pf
57	1K
58	10K
59	68K
60	0·1mfd
61	10K
62	0·01mfd
63	2·7K
64	0·01mfd
65	680 pf
66	0·01mfd
67	270 ohm
68	100 ohm
69	50pf
70	68pf
71	27 ohm
72	50pf
73	1K
74	27K
75	27K
76	68pf
77	2700pf
78	4·7K
79	0·1mfd
80	12K
81	10mfd
82	12K
83	0·1mfd
84	100mfd
85	2·2K
86	27K
87	400pf
88	30pf
89	5mfd
90	56K
91	18K
92	1K
93	100mfd
94	10K
95	450pf
96	0·1mfd
97	0·047mfd
98	5·6K
99	22K
100	27K
101	12K
102	1K
103	0·22mfd
104	15K
105	0·1mfd
106	450pf
107	1K
108	100mfd
109	3·9K
110	6·8K
111	6·8K
112	5·6K
113	0·22mfd
114	5·6K
115	5·6K
116	0·22mfd
117	5·6K
118	6·8K
119	560pf
120	560pf
121	4·7K
122	1500pf
123	1500pf
124	4·7K
125	560pf
126	6·8K
127	560pf
128	1000pf
129	1000pf
130	47 ohms
131	5·6K
132	0·01mfd
133	0·1mfd
134	1500pf
135	5·6M ohm
136	5·6M ohm
137	450pf
138	15K
139	2200pf
140	4700pf
141	68pf
142	320pf
143	20pf
144	10mfd
145	47K
146	0·1mfd
147	560 ohm
148	180K
149	1K
150	0·1mfd
151	1K
152	68pf
153	20pf
154	320pf
155	100 ohm
156	0·1mfd
157	10K
158	820 ohm
159	0·1mfd
160	56K
161	560 ohm
162	390pf
163	220pf
164	25mfd
165	0·1mfd
166	47K
167	88pf
168	20pf
169	320pf
170	400pf
171	400pf
172	180K
173	33K
174	1mfd
175	0·1mfd
176	27K
177	1K
178	0·1mfd
179	1K
180	400pf
181	400pf
182	68K
183	0·1mfd
184	15K
185	0·1mfd
186	1K
187	400pf
188	270 ohm
189	10K
190	0·1mfd
191	0·001mfd
192	10K
193	3·9K
194	220K
195	2·2M ohm
196	0·001mfd
197	0·01mfd
198	56K
199	150K
200	4·7K
201	25mfd
202	470K
203	100 ohm
204	100K
205	10K
206	100mfd
207	100K
208	27K
209	270 ohm
210	25mfd
211	25mfd
212	68K
213	6·8K
214	18K
215	2·7K
216	25mfd
217	25mfd
218	0·22mfd
219	10mfd
220	270 ohm
221	5·6K
222	0·015mfd
223	12K
224	0·0068mfd
225	1·5K
226	0·0033mfd
227	4·7K
228	0·047mfd
229	0·047mfd
230	8·2K
231	8·2K
232	0·01mfd
233	8·2K
234	270K
235	2200pf
236	0·015mfd
237	2200pf
238	0·02mfd
239	4·7K
240	5·6K
241	3·9K
242	25mfd
243	25mfd
244	68K
245	18K
246	1M ohm
247	3·9K
248	100mfd
249	10mfd
250	4·7K
251	4·7K
252	47K
253	0·1mfd
254	4·7K
255	250pf
256	6·8K
257	5mfd
258	47K
259	450pf
260	25mfd
261	100K
262	100K
263	68K
264	33 ohm
265	320mfd
266	1·5K
267	68pf
268	2·7K
269	50mfd
270	1K
271	1K
272	390 ohm
273	1250mfd
274	*10mfd
275	*10mfd
276	*VA 1098
277	*510 ohm
278	*22K
279	*510 ohm
280	*VA 1098
281	*22K

*On some early models the VA 1047 thermistor was used instead of the VA 1098. In these cases 39K resistors were used instead of 22K, 1K instead of 510 ohms and 5mfd capacitor instead of 10mfd.

Circuit Ref.	Value
282	47 ohm
283	47 ohm
284	0·82 ohm
285	0·82 ohm
286	1250mfd
287	10 ohm
288	0·1mfd
289	1·5K
290	0·0022mfd
291	1·2K ohm
292	1250mfd
293	270 ohm
294	1K
295	0·1mfd
296	3·9K
297	220 ohm
298	2·7 ohm
299	2·7K ohm
300	1500mfd
301	0·1mfd
302	50mfd
303	220 ohms
304	0·1mfd
305	250pf
306	0·1mfd
307	220pf
C22 & C27 only:	
304	47K
305	470K
306	25mfd
307	470 ohms
1256	6·8K
1257	0·1mfd
1260	25mfd
1261	33 ohm
1262	100K
1263	100K
1264	22 ohm
1265	2200pf
1266	8·2K
1267	2200pf
1268	2·7K
1269	50mfd
1270	1K
1271	1K
1272	390 ohm
1274	10mfd
1275	10mfd
1276	Cz 10
1277	750 ohm
1278	18K
1279	750 ohm
1280	Cz 10
1281	18K
1282	51 ohm
1283	51 ohm
1284	0·47 ohm
1285	0·47 ohm
1287	22 ohm
1288	8·2K
1289	0·0015 mfd
1290	1·5K

Alignment

The method of alignment described below will locate most faults that affect alignment. Alignment should not be attempted without proper equipment.

FM IF ALIGNMENT

1 Connect oscilloscope to junction of R75, C77. Set oscilloscope to 10 milli-volts per cm.

2 Connect sweep generator via 0·01 mfd to base of TR7. Set generator to 10·7 mHz. Unwind bottom tuning slugs on all FM IFT's so that the bottom of the slugs are level with the printed circuit board.

3 Adjust L20, L18 for normal discriminator response with peak to peak of 500 kHz centred on 10·7 mHz.

4 Transfer generator to base of TR5. Reduce output from generator. Unwind bottom slug of L20 until bottom of slug is level with printed circuit board. Adjust L16, L17 for maximum putput, this will show a broad top with −3dB points at 10·5 and 11 mHz.

5 Transfer generator to base of TR4. Adjust L14, L15 for maximum output. Reduce output of generator as alignment proceeds. This will give a flat top response (perhaps a slight dip in centre) with −3dB points at 10·5 and 10·9 mHz.

6 Transfer generator to base of TR3. *Increase* output from generator. Adjust L12, L13 for maximum output. (Earth lead of generator must be connected close to TR3). This will give similar response to step 5 but with −3dB points at 10·6 and 10·8 mHz.

7 Transfer generator to base of TR2. Adjust L10, L11 for maximum output. Response should be as 6.

8 Leave generator on base of TR2. Adjust L20 for normal discriminator response. Recheck L10 for maximum output. With oscilloscope set for 100 mV/cm check that discriminator response is linear and with a peak to peak to 400 kHz minimum centred on 10·7 mHz.

Note:
Never readjust any slugs after moving on to next step of alignment. It may be that spurious signals show on the oscilloscope during alignment. A very short wire shorting out the FM oscillator section of the gang will prevent this.

FM RF and OSCILLATOR ALIGNMENT

9 Check that dial log scale reads 0 when gang is fully in mesh.

10 Transfer generator ot coax aerial socket, and adjust generator for 22·5 kHz deviation at 88 mHz with 1 kHz modulation. Tune receiver to 88 mHz on dial. Adjust L8, L6, L7 in that order for maximum output. Keep generator input below that at which limiting starts.

11 Tune generator and receiver to 108 mHz. Adjust C22, C14, C11 in that order for maximum output.

12 Repeat 10 and 11 until no further improvement in sensitivity and/or tracking results.
The FM alignment is now complete.

Note:
If realigning, unwind all slugs before starting.

AM IF ALIGNMENT

1 Connect oscilloscope or valve voltmeter to junction of C197 and S10.

2 Connect generator to centre section of AM gang and earth. Tune generator to 430 kHz with 30% modulation at 400 Hz.

3 Adjust L41, L40, L39, L38, L37 in that order for maximum output. Repeat adjustments until there is no further increase in output. It is very important that the generator output be as low as possible.

MEDIUM WAVE RF AND OSCILLATOR ALIGNMENT

4 Transfer generator to AM aerial input. Switch receiver to MW and tune to 550 metres. Leave generator set to 430 kHz. Adjust L26 for *minimum* output.

5 Set generator to 550 metres.
Adjust L34, L30, L27 in that order for maximum output.

6 Set generator to 200 metres. Tune receiver to 200 metres. Adjust C168, C153, C143 in that order for maximum output.

7 Repeat steps 5 and 6 until no further increase in output or improvement in tracking results.

LONG WAVE RF AND OSCILLATOR ALIGNMENT

8 Set generator to 1500 metres. Switch receiver to LW and tune to 1500 metres.
Adjust L36, L31, L28 in that order for maximum output.

Note:
There are no trimmers on LW.
The AM alignment is now complete.

Note:
If realigning, unwind all slugs before starting.

ALIGNMENT OF M8 STEREO DECODER

A Stereo Signal Generator must be used and be capable of providing:

1 A modulated signal between 88–108 mHz (a single spot frequency will do).
2 Pilot only.
3 A+B.
4 A or B at 1 kHz.
5 A−B.

1 Connect the generator to the FM aerial input of the Tuner or Tuner-Amplifier. Switch Tuner to FM stereo. Set signal generator for 100 micro-volts output, modulated by pilot only. (19 kHz, 9% modulation). Set tuner carefully to generator frequency. Connect oscilloscope to collector of TR10 on Decoder, with oscilloscope sensitivity set to 1V per cm.

2 Tune L23, L24 for maximum output. Signal should reach 2 to 3 volts peak to peak at 19 kHz.

3 Transfer Y input of oscilloscope to junction of C87 and C89. Set oscilloscope sensitivity for 10 millivolts per cm. Switch time base off and connect X amplifier to collector of TR10 via 500 pf capacitor. Set X amplifier for 1V per cm.

4 A figure of eight should now appear on the oscilloscope similar to Fig. 1. L23 should be adjusted carefully slightly clockwise for an exact centre crossover point as in Fig. 2.

Fig. 1

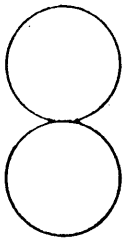


Fig. 2

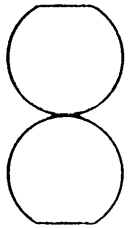


Fig. 3

Decoder Alignment

Note:
A flat top or bottom to the eight is unimportant. For example see Fig. 3.

5 Disconnect oscilloscope. At this stage the stereo pilot lamp fitted to the tuner should be alight and remain alight when the pilot level is reduced to at least 7%.

6 Connect a suitable output meter to the audio output of the tuner (or tape recording output on tuner-amplifier). Set sensitivity for approximately 1 volt. In case of tuners, check that pre-set output controls are at maximum.

7 Set stereo generator for A+B (at a modulation level of 35% at 1 kHz *with pilot switched off*). With pilot switched on, the combined levels should be 44%. Leave pilot on! The output meter should read approximately 400 millivolts each channel. Channel matching should be ±1dB.

8 Switch modulation to A−B. Output meter should remain the same as for A+B.

9 Switch to A only, then B only (with pilot on). The respective channels should show the same output as before. Cross Talk should be at least 25 dB down. The actual figure will generally be better than this but will depend on correct alignment of the tuner and decoder. Alignment is now completed.

Note:
If a 67 kHz storecast filter is fitted as in some export models, this should be tuned for *minimum* output with a modulated signal of 67 kHz, 10% modulation depth via the normal stereo generator SCA socket.

Specifications

AMPLIFIER AND CONTROL UNIT

RMS Power Output	25 watts per channel into 8 ohms
Power response	25 watts, 20-20,000 Hz
Frequency response	20-20,000 Hz ±1 dB
Harmonic distortion	Less than 0·5% measured at 25 watts output
Crosstalk	Better than 40 dB
Channel matching	±1 dB
Bass control	±10 dB at 70 Hz
Treble control	±10 dB at 10 kHz
Balance control	Maximum to zero each channel
Rumble filter	−5 dB at 30 Hz increasing at lower frequencies.
Treble filters	1.6.5 kHz-3 dB, 10 kHz-25 dB 2.4.5 kHz-3 dB, 9 kHz-40 dB
Loudness	At 1 kHz reference (−20 dB), 70 Hz+10 dB, 10 kHz+5dB
Tape recording output	400 mV Low impedance
Headphone output	Suitable for all stereo phones
Inputs	Sensitivity / Hum and Noise (reference 25 W)
Tape playback	400 mV — −70 dB
Pickup 1. Creamic	60 mV — −55 dB
Pickup 2. Magnetic	3·5 mV — −55 dB

FM TUNER SECTION

Coverage	86-109 mHz
Sensitivity	Mono 1·5μV, Stereo 5μV for 30 dB signal to noise ratio at 75 KHz deviation.
Intermediate frequency	10·7 mHz
IF bandwidth	220 kHz at 6 dB down
IF rejection	80 dB
Aerial inputs	70-80 ohms and 300 ohms

AM TUNER SECTION

Coverage	Medium waveband 185-590 metres; 510-1,625 kHz Long waveband 1,000-2,000 metres; 150-300 kHz
Sensitivity	5 μV for 20 dB signal to noise ratio
Intermediate frequency	430 kHz
IF bandwidth	4 kHz at 6 dB down
IF rejection	80 dB

STEREO RADIO DECODER M8 & M4

Frequency response	30-15,000 Hz ±1 dB
Channel separation	30 dB at 1 kHz
Hum and noise	−60 dB
Filters	38 kHz each channel
Suppression 38 kHz	40 dB
De-emphasis	50 μ/secs (European) 75 μ/secs (N. America)

POWER SUPPLIES AMPLIFIERS & TUNER AMPLIFIERS

AC voltage	All models 105-125, 210-250; 50-60 Hz
Maximum power consumption	72 watts

AUDIO OUTPUT—TUNERS

Output voltage	Variable 0-1 volt
Impedance	Low matching all amplifiers

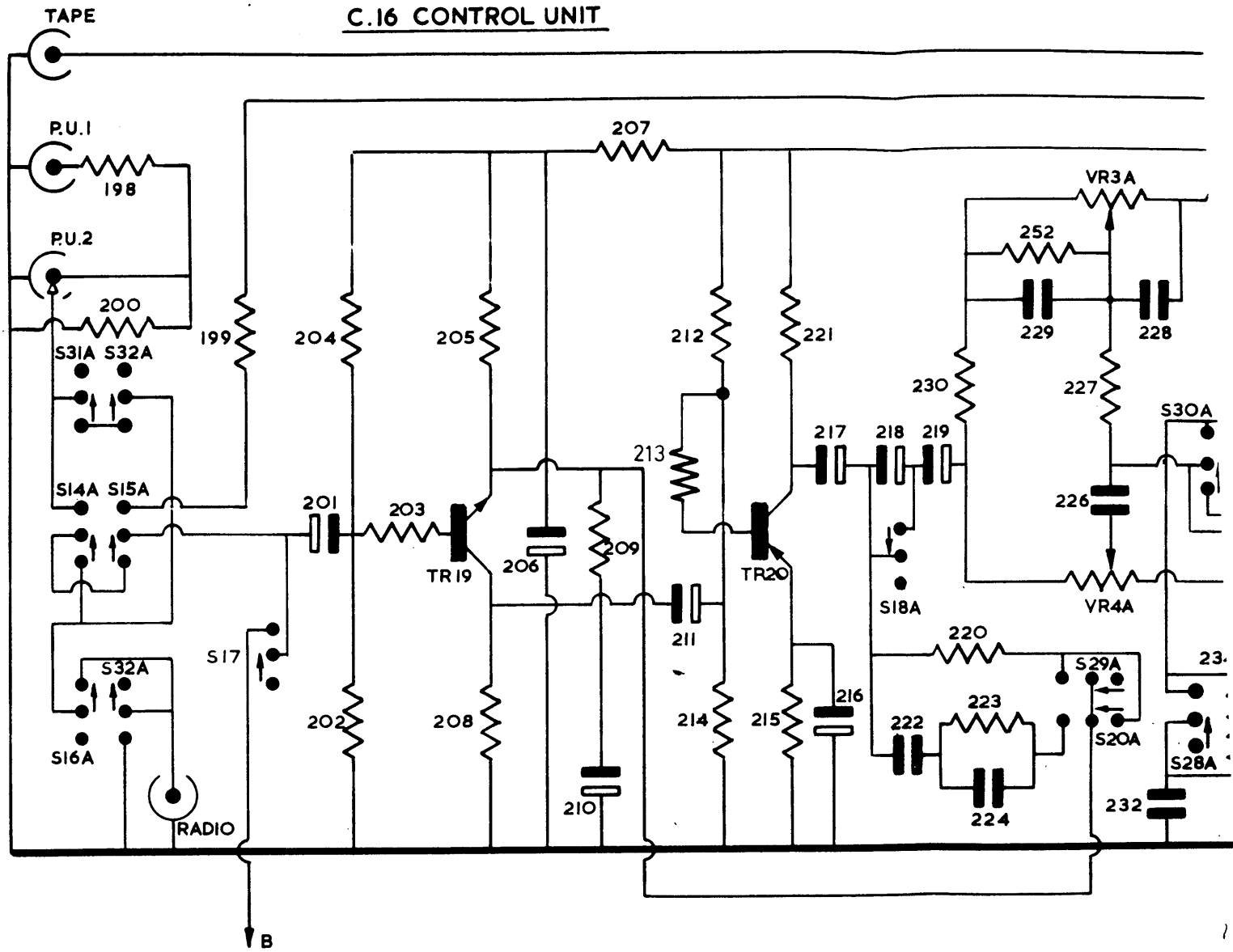
TUNER POWER SUPPLIES

AC voltage	105-125, 210-250; 50-60 Hz
Maximum power consumption	15 watts

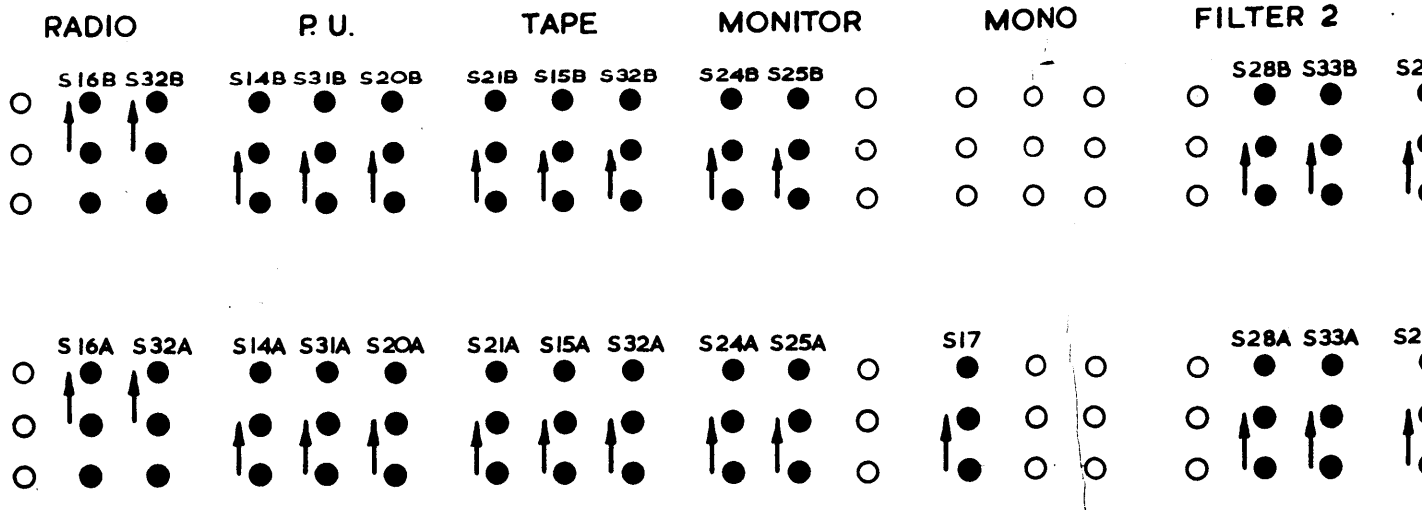
Printed by Newpar Press Ltd., Lyon Road, Bletchley, Milton Keynes MK1 1EX

CIRCUIT [

C.16 CONTROL UNIT



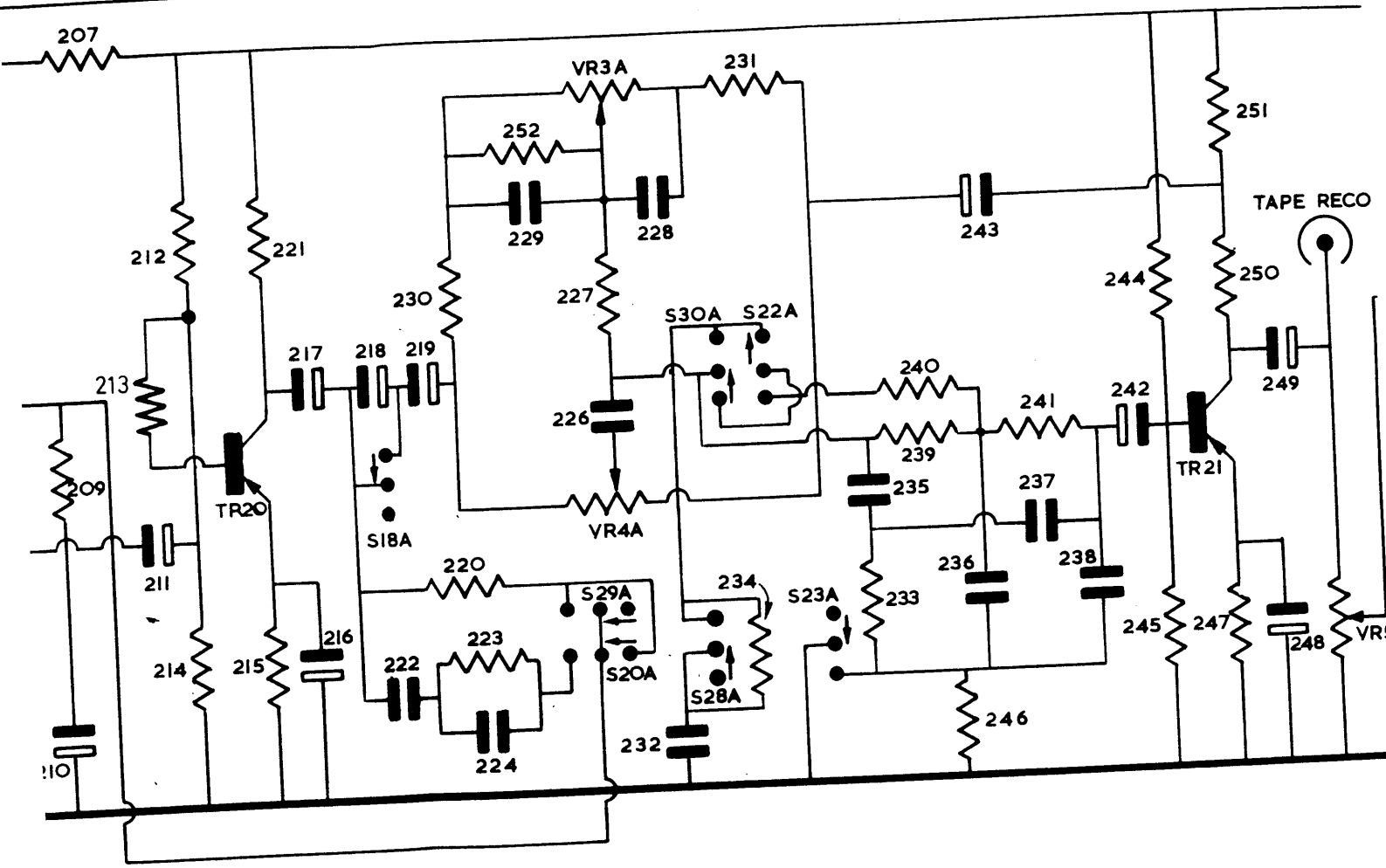
PUSH–BUTTON SWITCHING



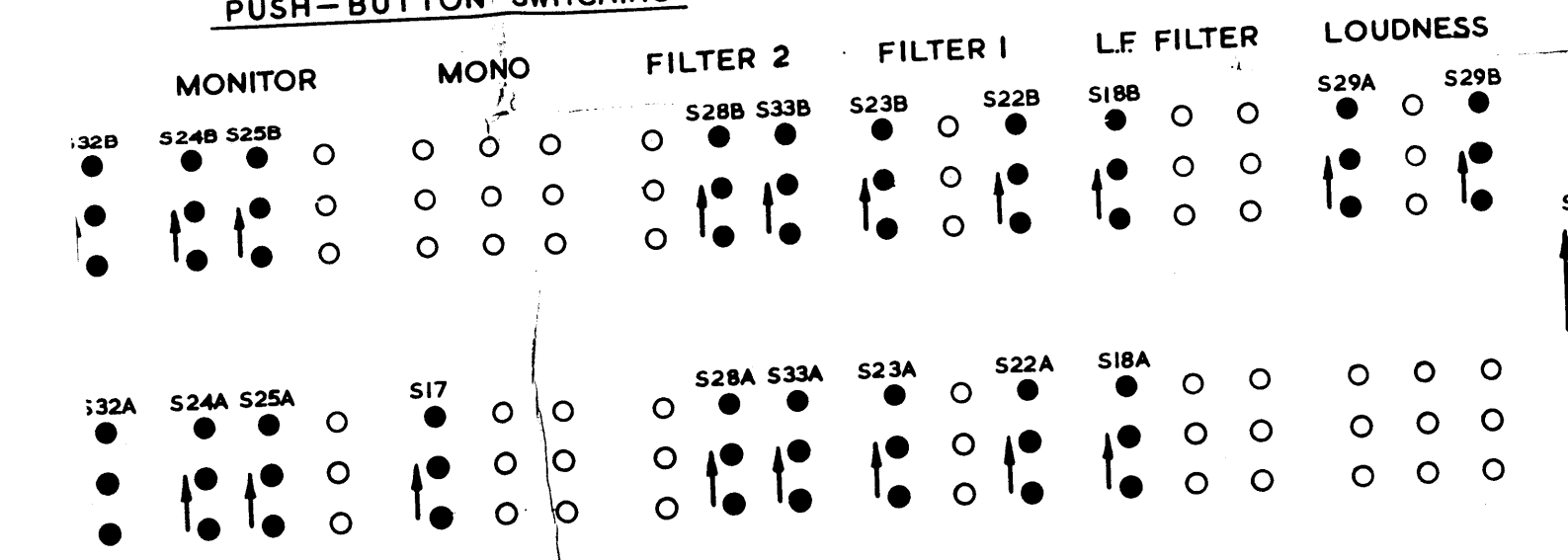
SWITCHES SHOWN LOOKING FROM FRONT
(SWITCHED TO RADIO)

CIRCUIT DIAGRAM & COMPON

NIT



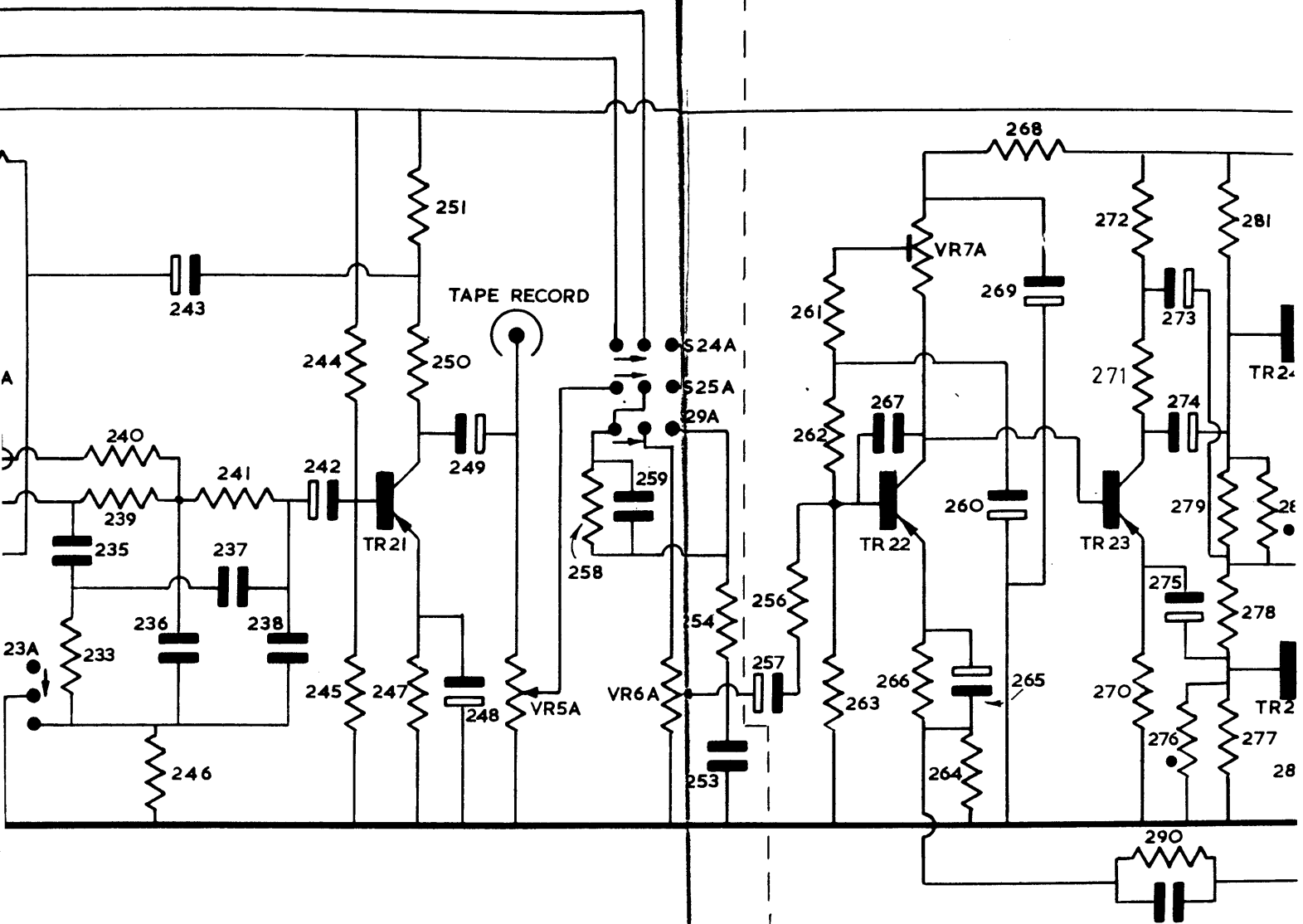
PUSH-BUTTON SWITCHING



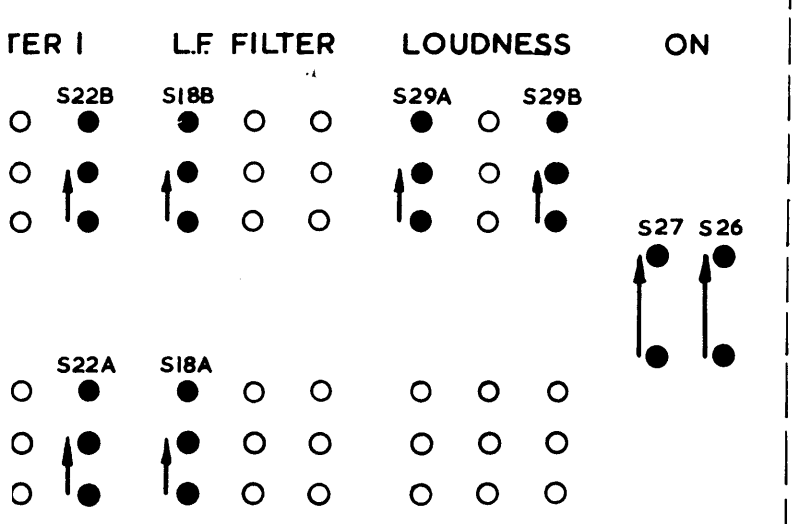
SWITCHES SHOWN LOOKING FROM FRONT

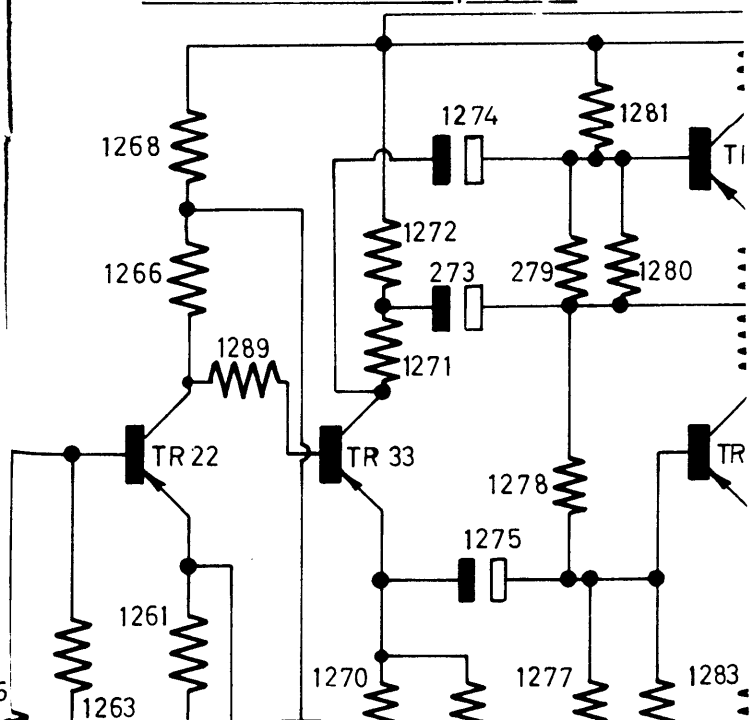
AGRAM & COMPONENT LAYOUT 521 STER

A.14 POWER AMPLIFIER



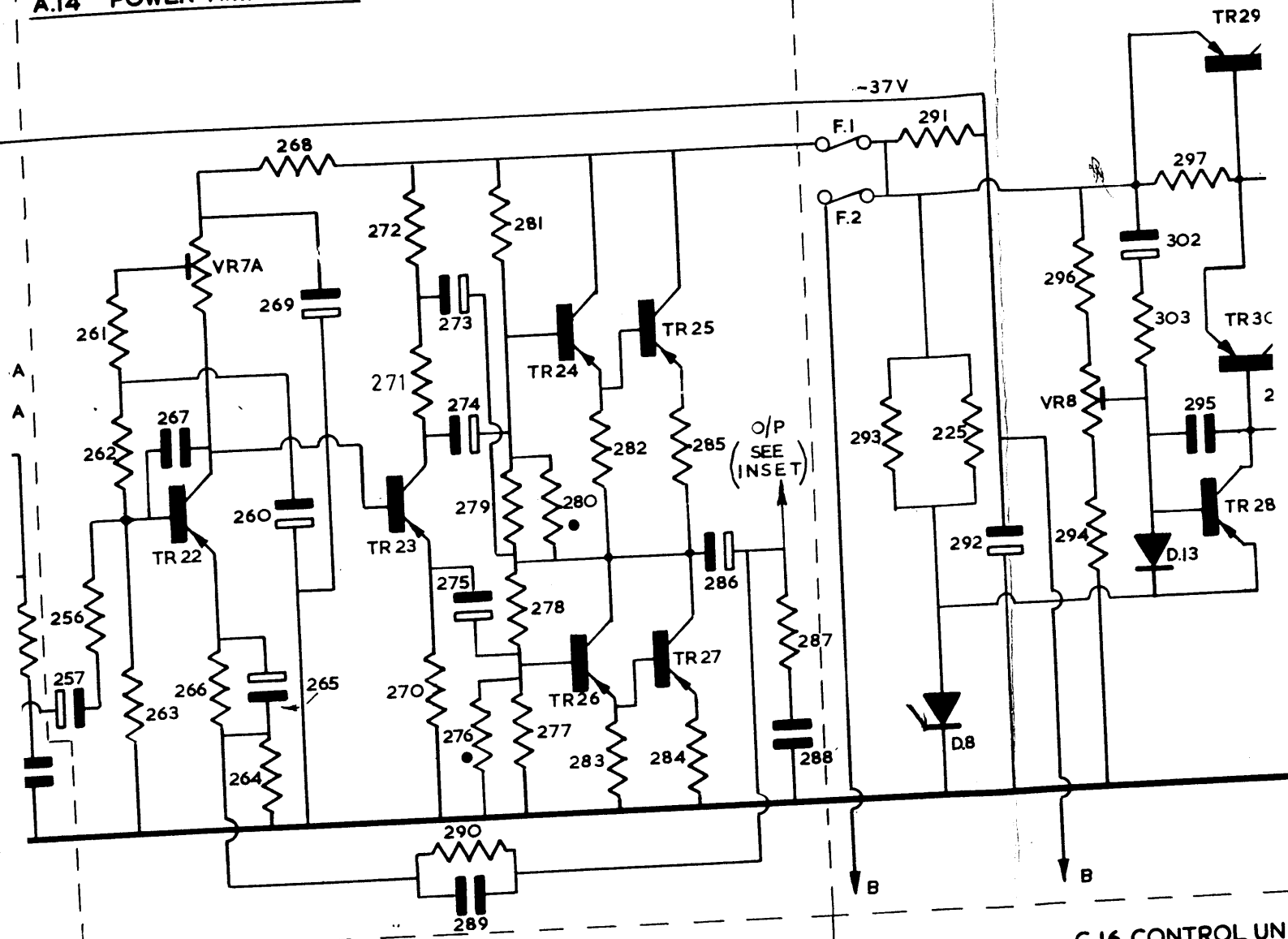
A 15 Power Amplifier.



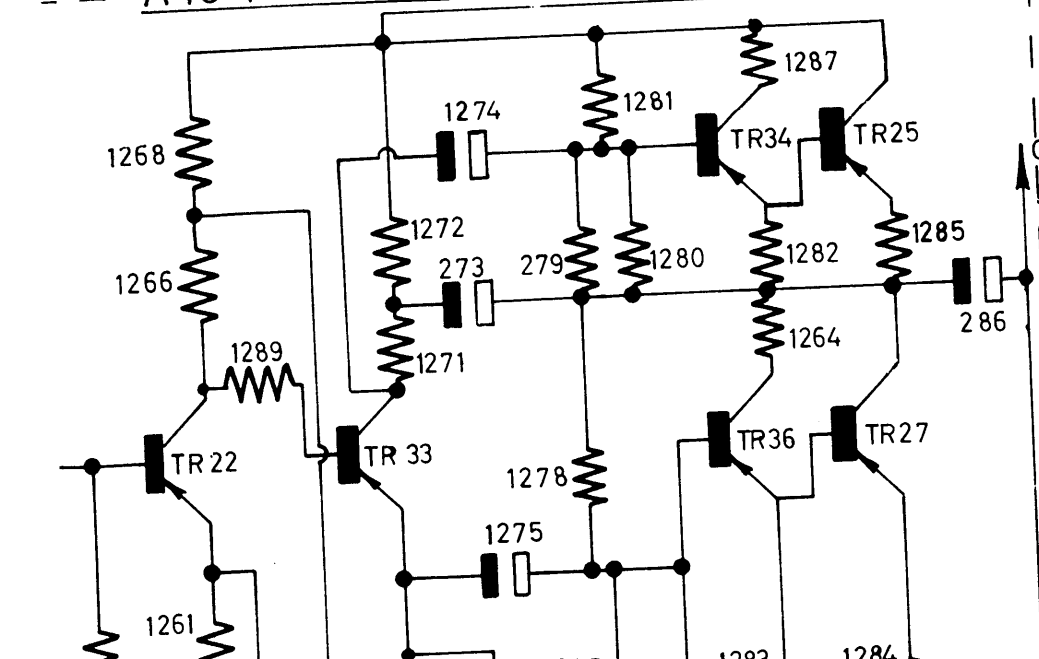


AYOUT 521 STEREO AMPLIFIER

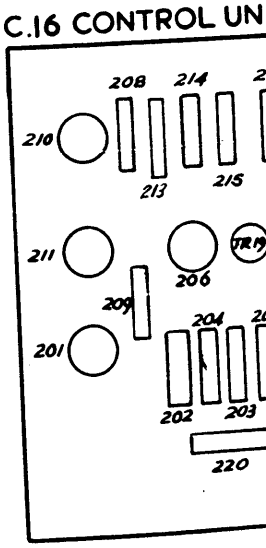
A.14 POWER AMPLIFIER



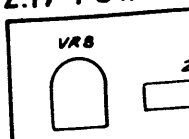
A 15 Power Amplifier.



C.16 CONTROL UN

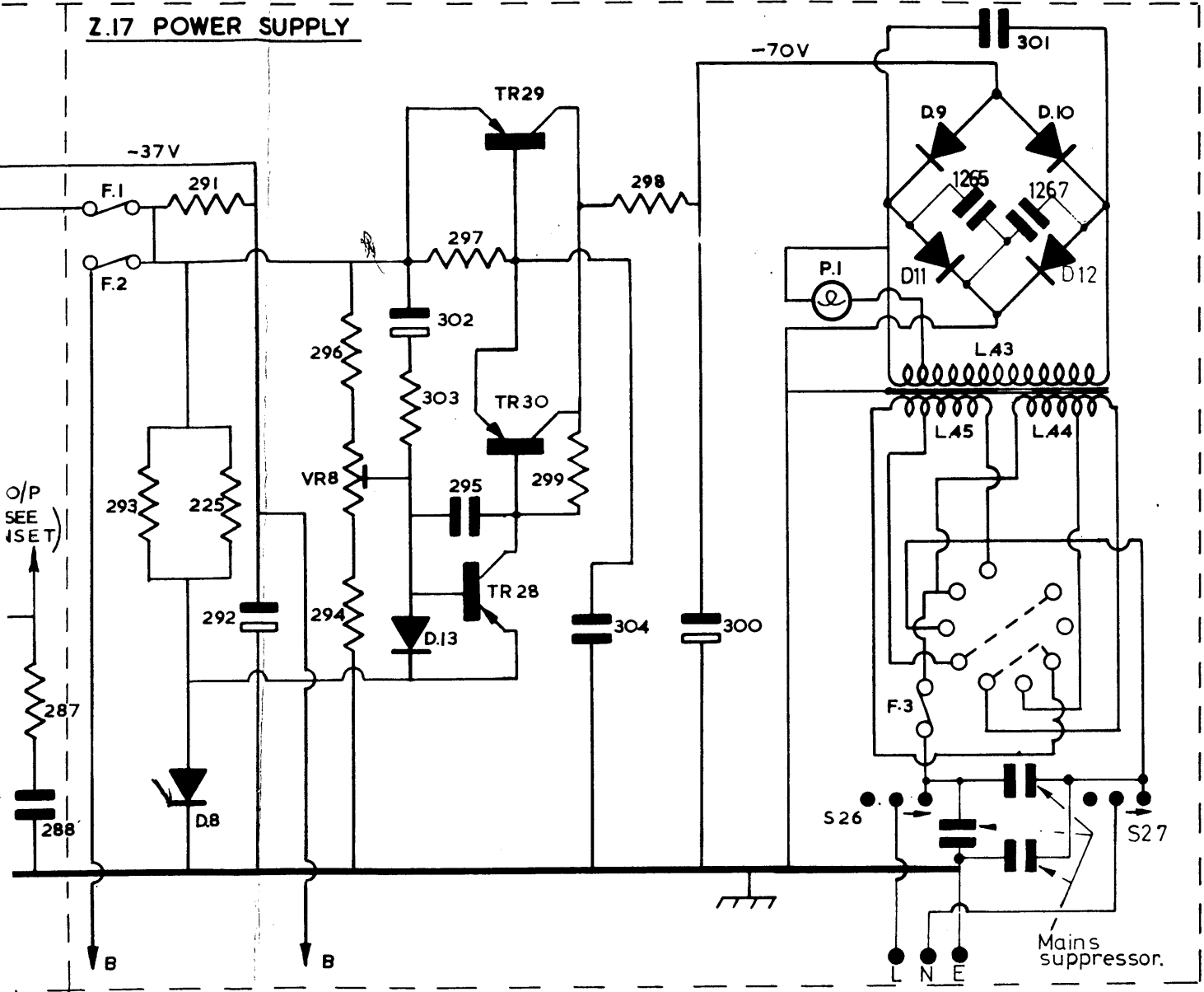


Z.17 POWER

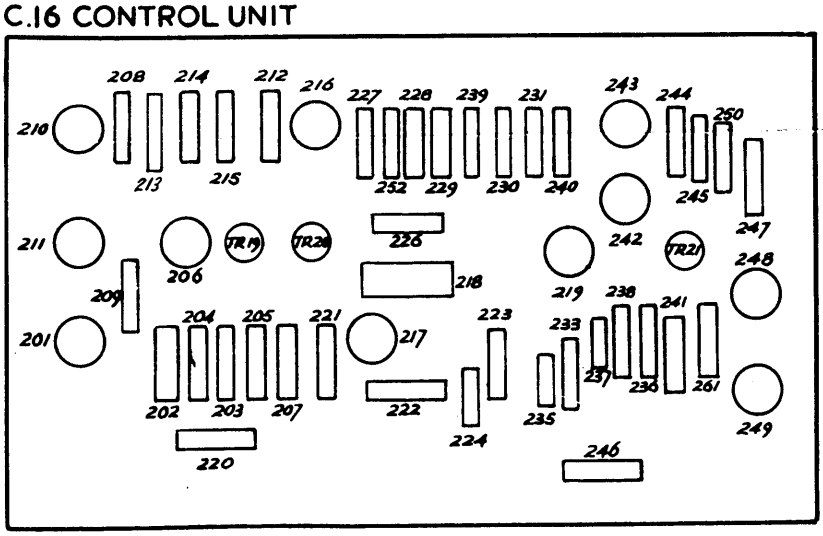


MPLIFIER

Z.17 POWER SUPPLY



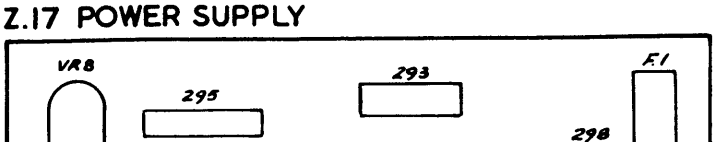
C.16 CONTROL UNIT

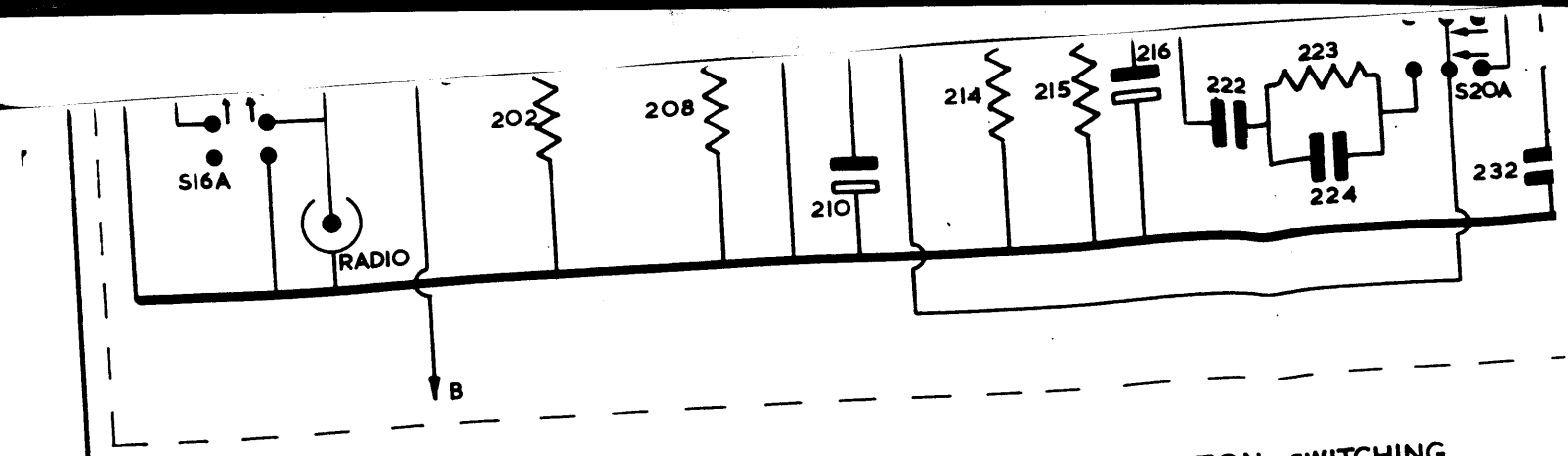


O/P(see inset)

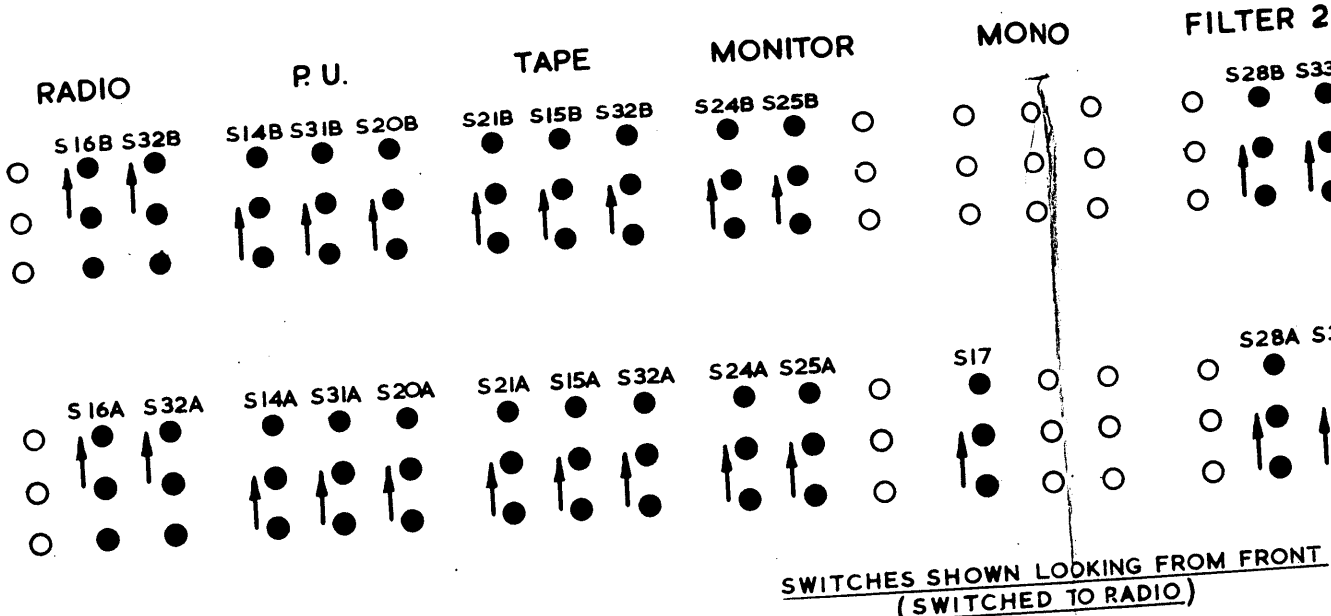
36

Z.17 POWER SUPPLY



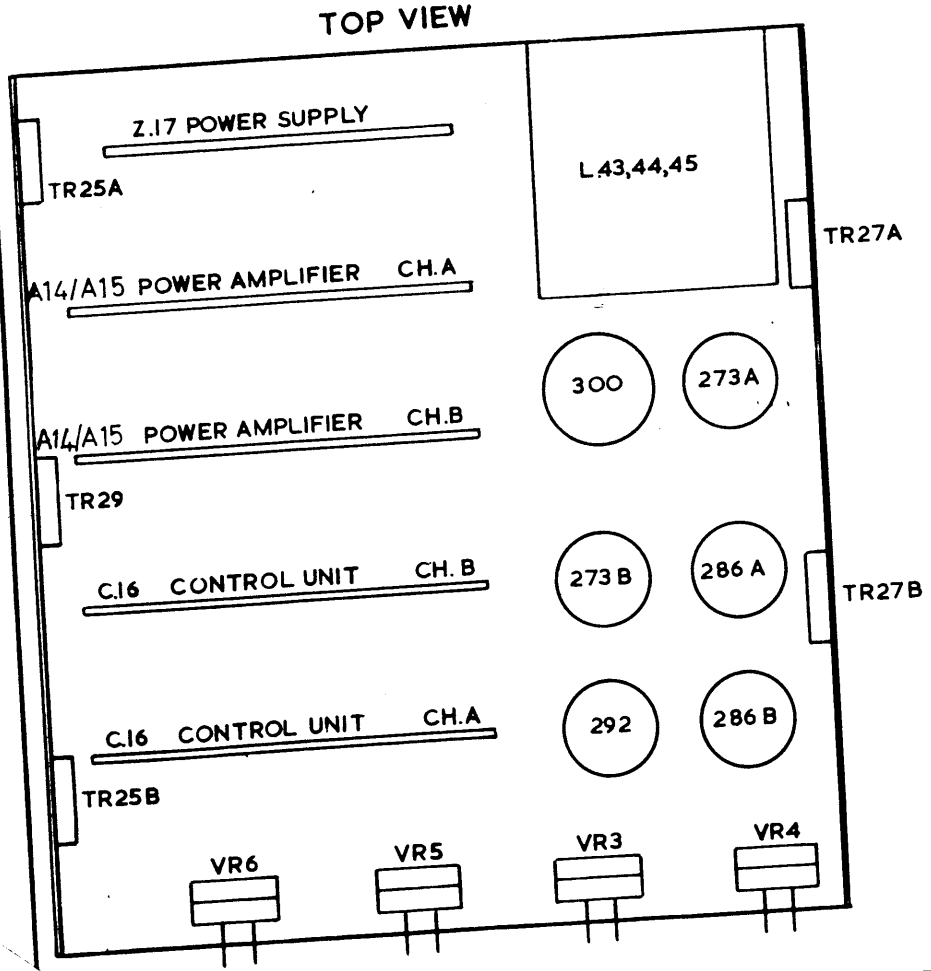


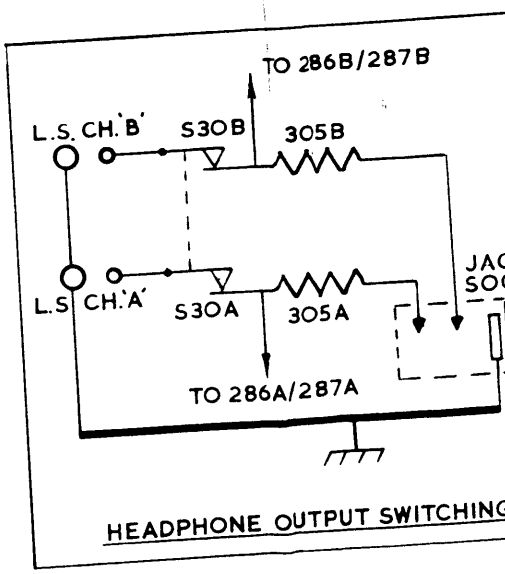
PUSH-BUTTON SWITCHING



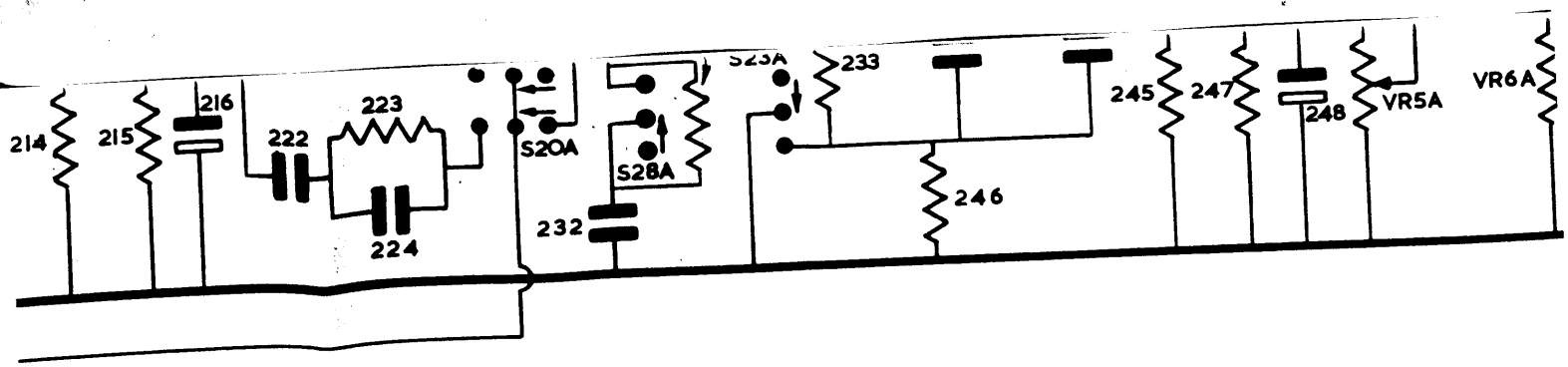
SWITCHES SHOWN LOOKING FROM FRONT
(SWITCHED TO RADIO)

TOP VIEW

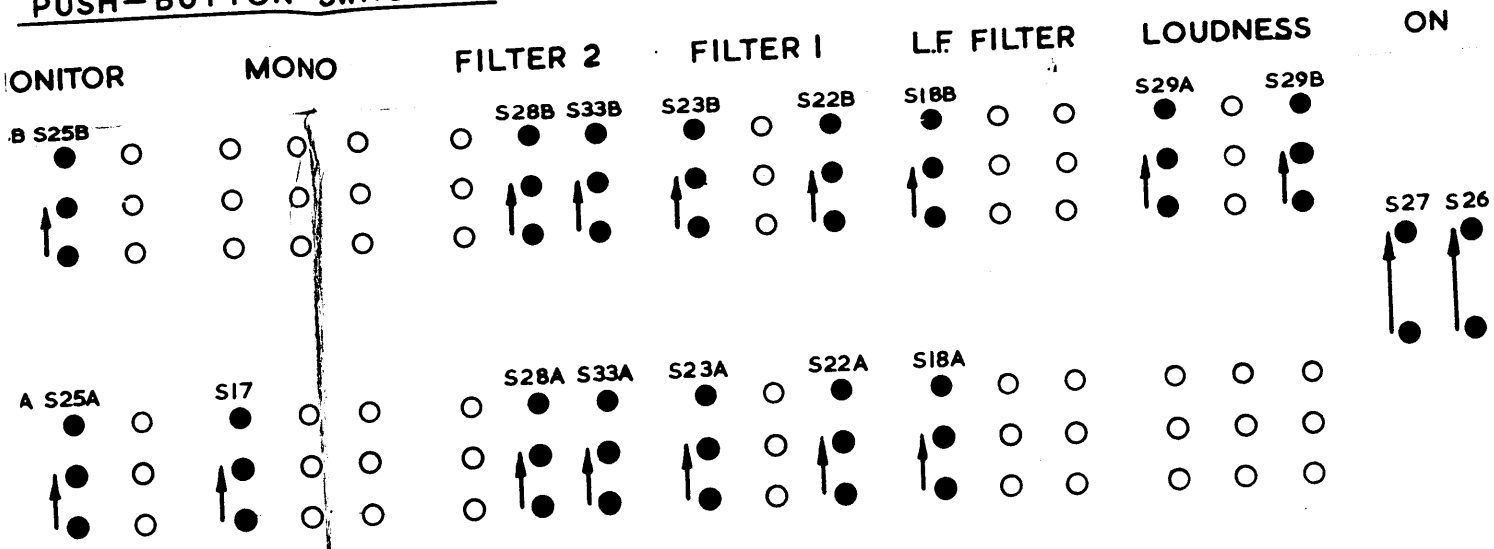




HEADPHONE OUTPUT SWITCHING



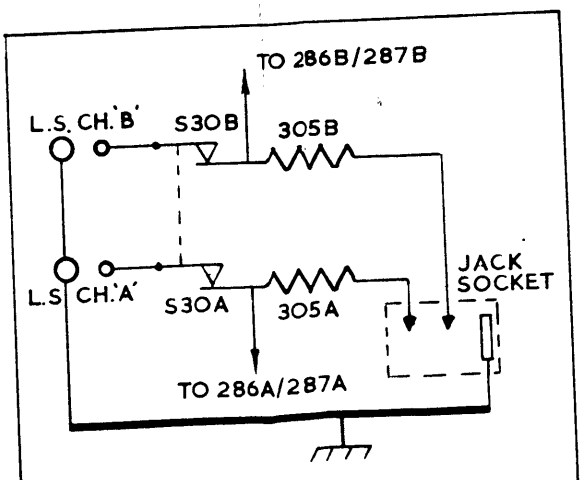
PUSH-BUTTON SWITCHING



SWITCHES SHOWN LOOKING FROM FRONT
(SWITCHED TO RADIO)

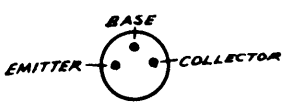
NOTE: CIRCUIT DIAGRAM SHOWS CHANNEL 'A' ONLY.
CHANNEL 'B' IS DUPLICATED EXACTLY.

A15 POWER AMPLIFIER BOARD FITTED
FROM SERIAL No 417650 ONWARDS.

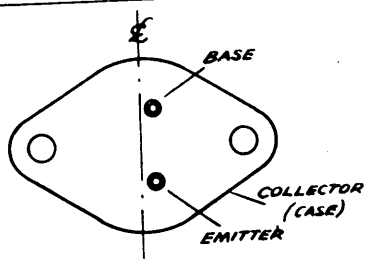


HEADPHONE OUTPUT SWITCHING

TRANSISTOR CONNECTIONS

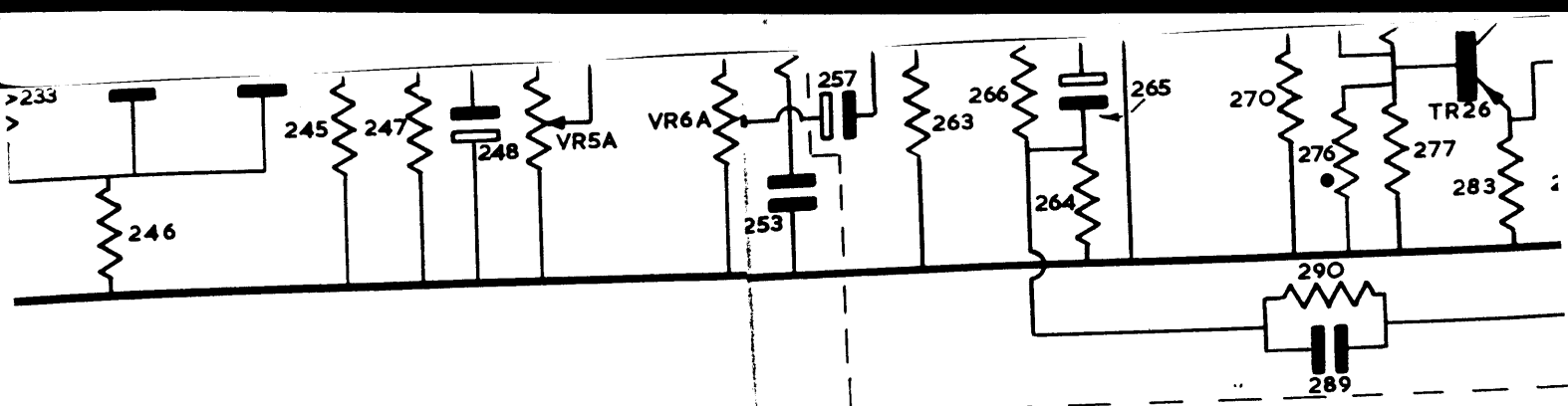


AC 191
AC 139
AC 142
AT 210

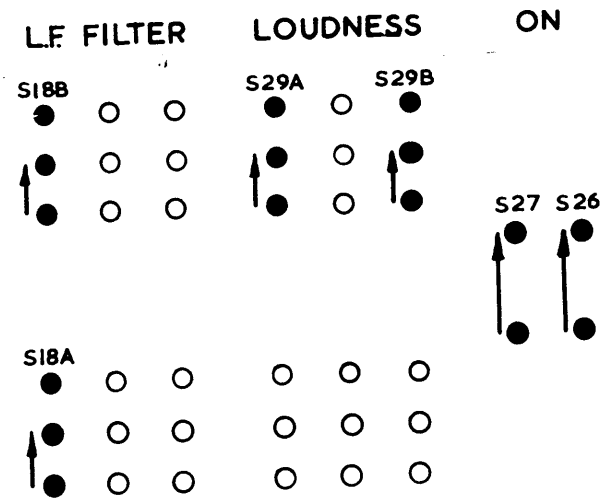


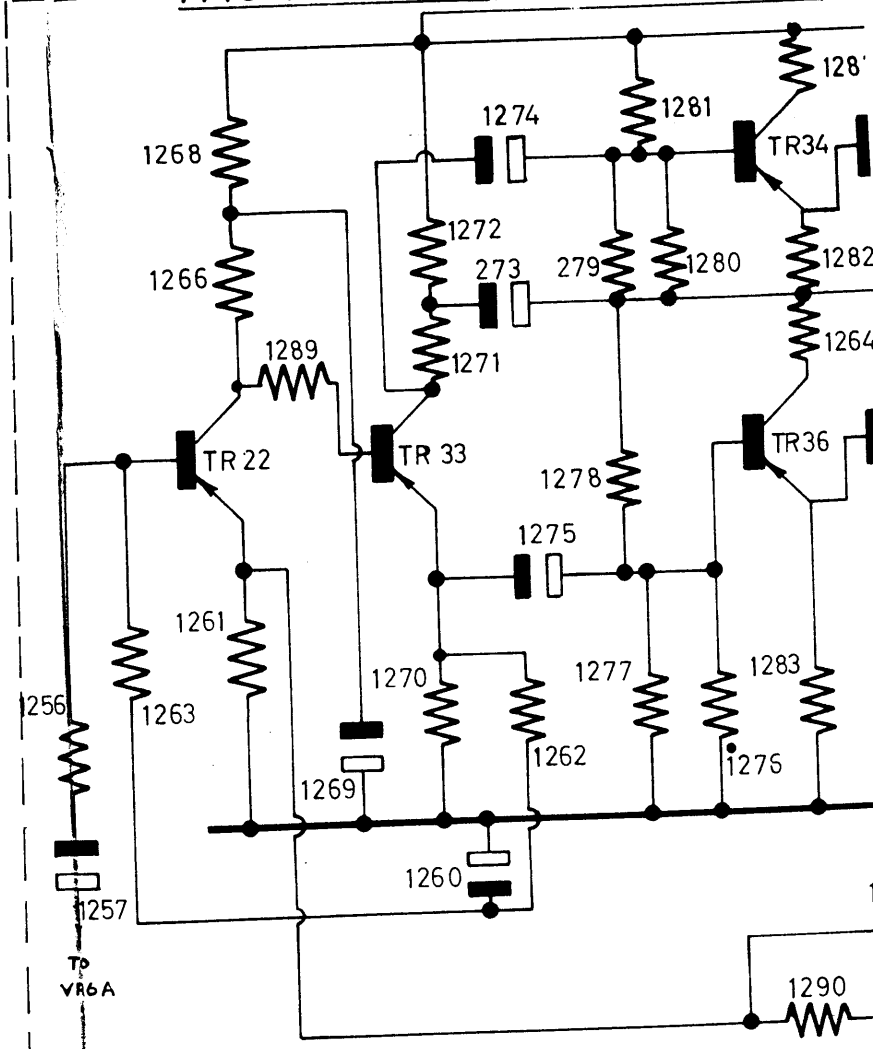
AL 102

BC109
BSV44



A15 Power Amplifier.

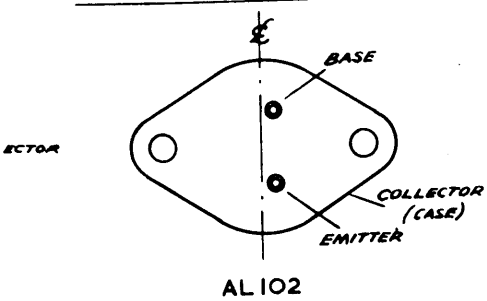




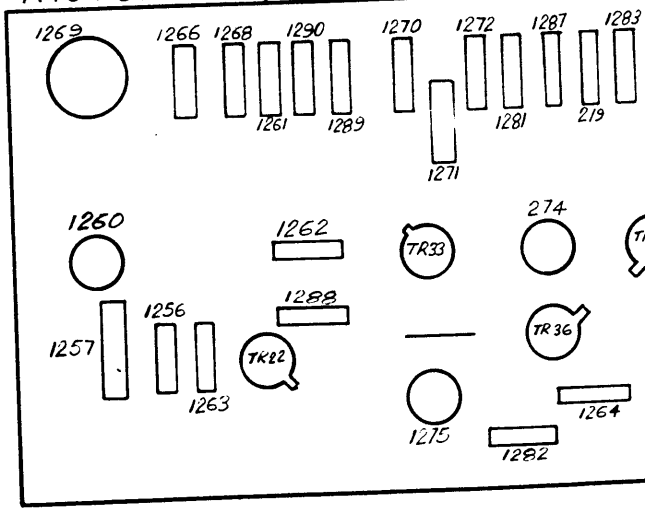
RCUIT DIAGRAM SHOWS CHANNEL 'A' ONLY.
HANNEL 'B' IS DUPLICATED EXACTLY.

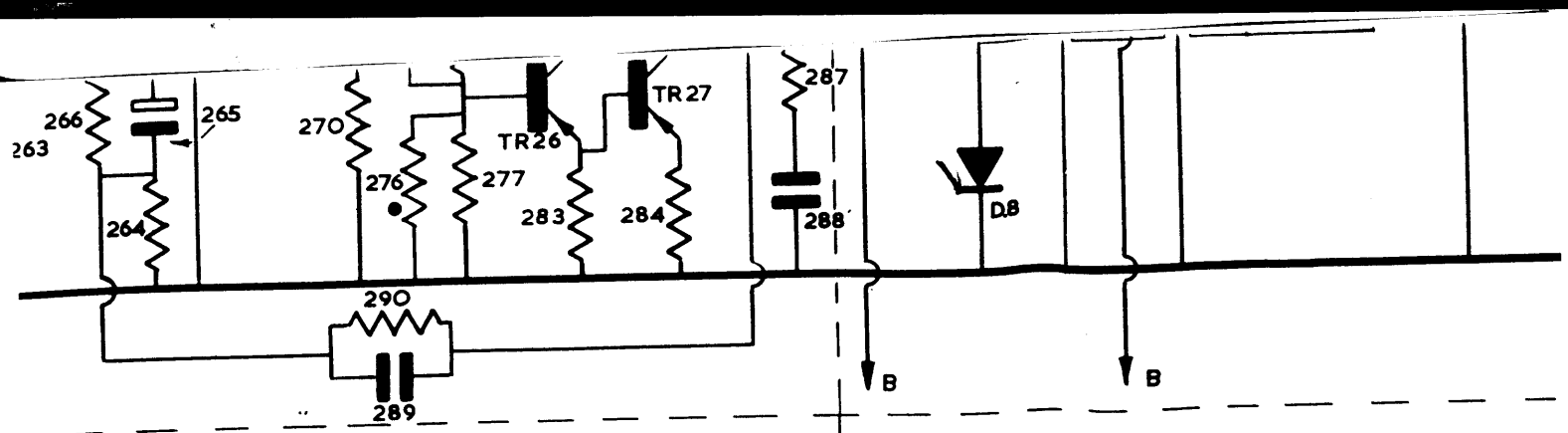
15 POWER AMPLIFIER BOARD FITTED
ROM SERIAL No 417650 ONWARDS.

TRANSISTOR CONNECTIONS

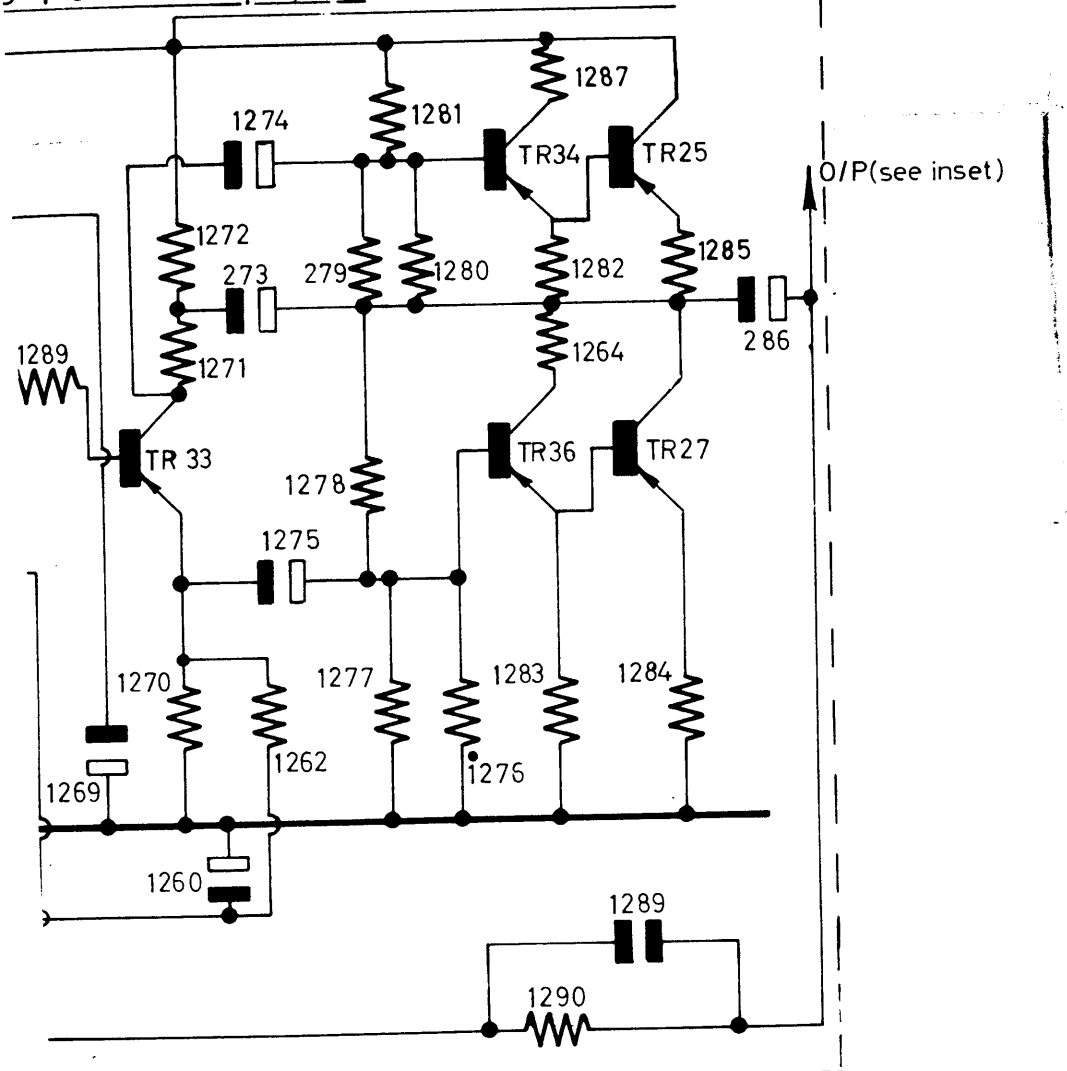


A15 Power Amplifier

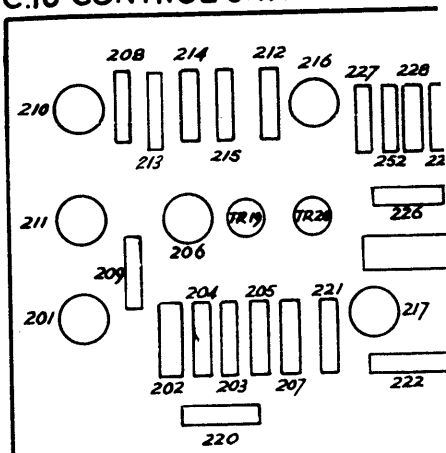




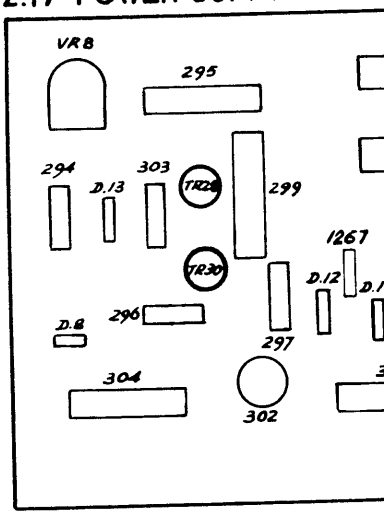
5 Power Amplifier.



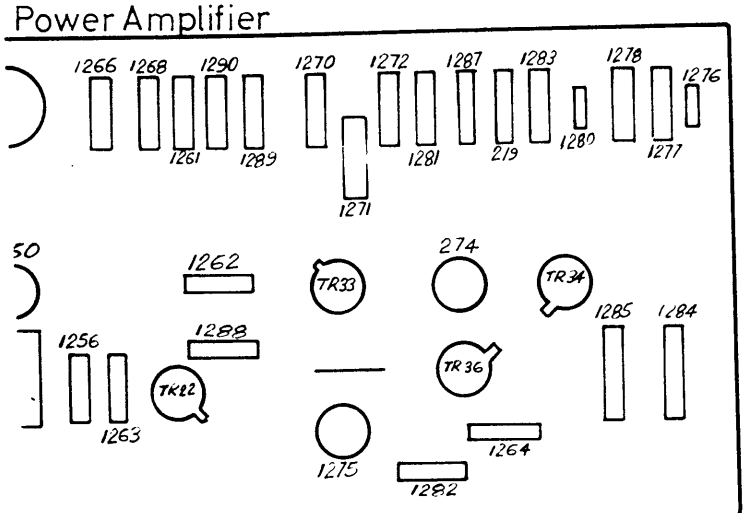
C.16 CONTROL UNIT



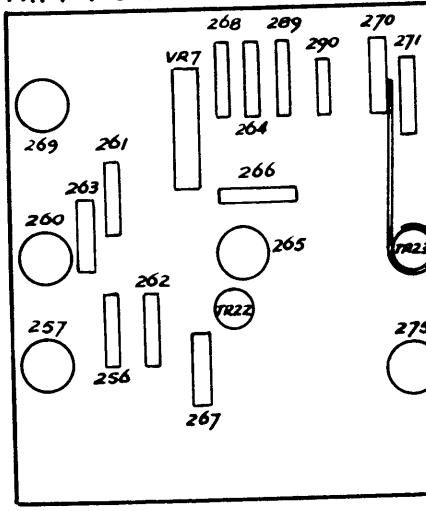
Z.17 POWER SUPPLY

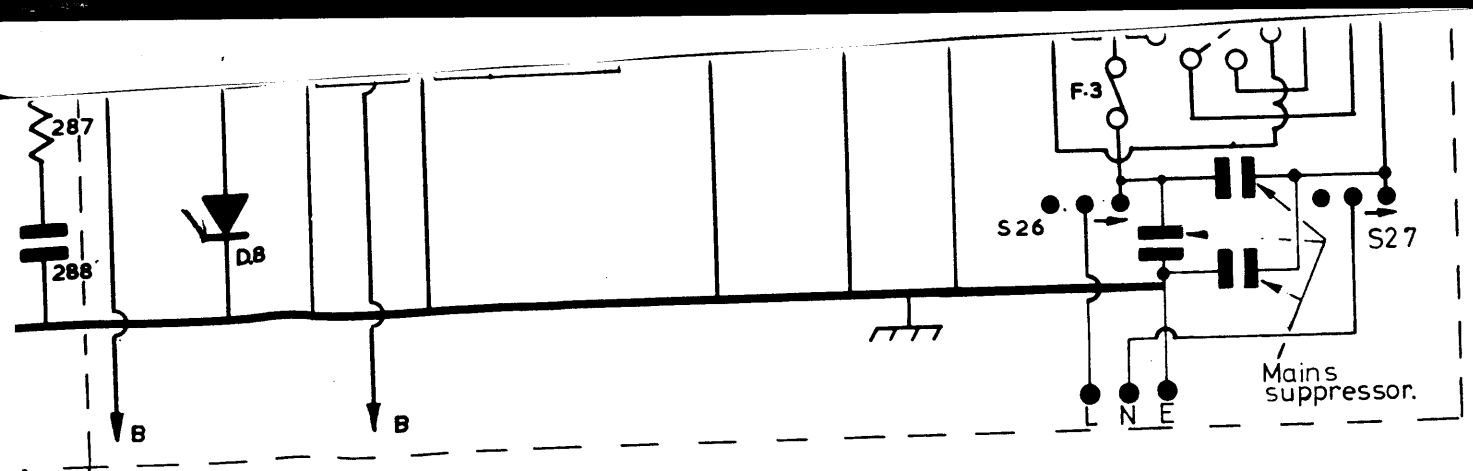


Power Amplifier



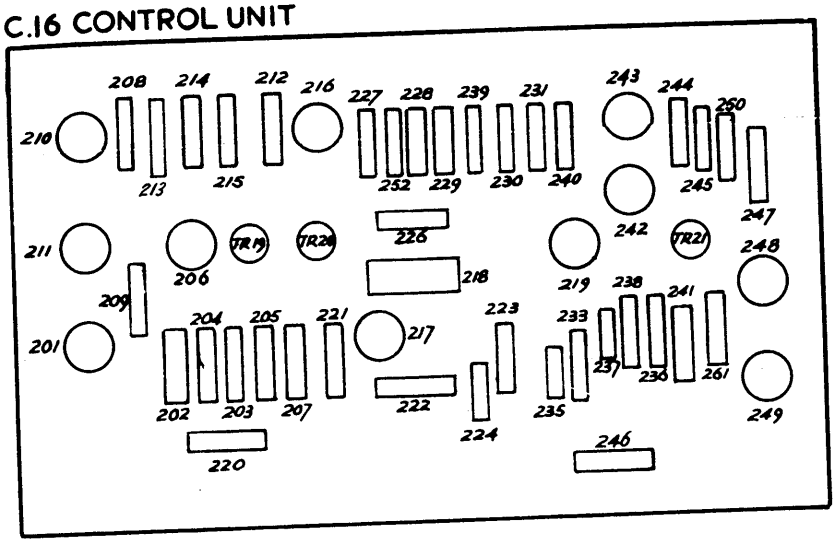
A.14 POWER AMPLIFIER



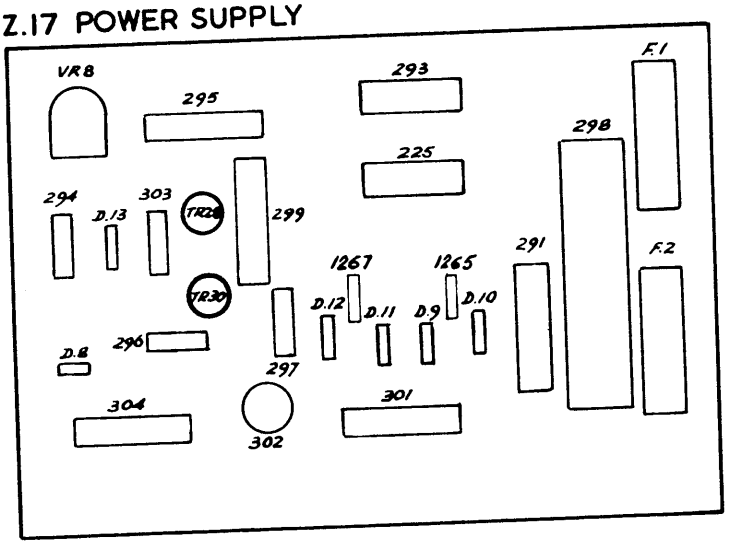


O/P(see inset)

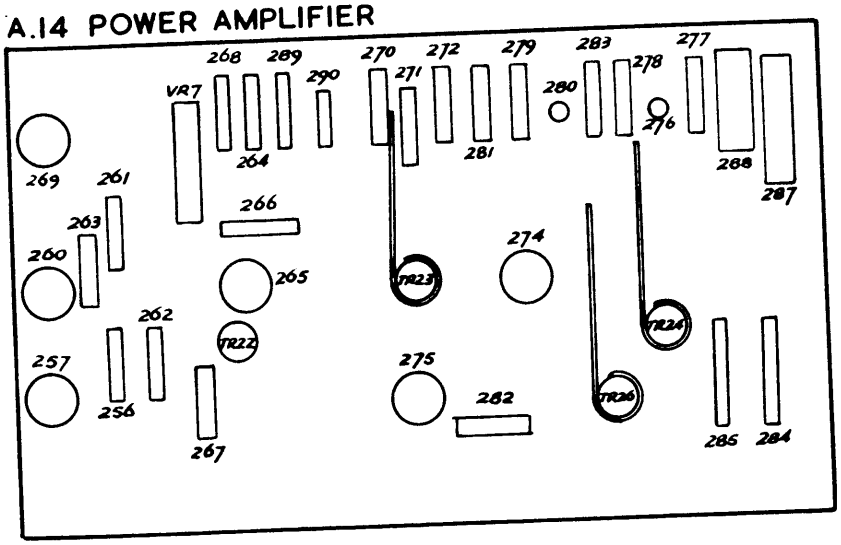
C.16 CONTROL UNIT



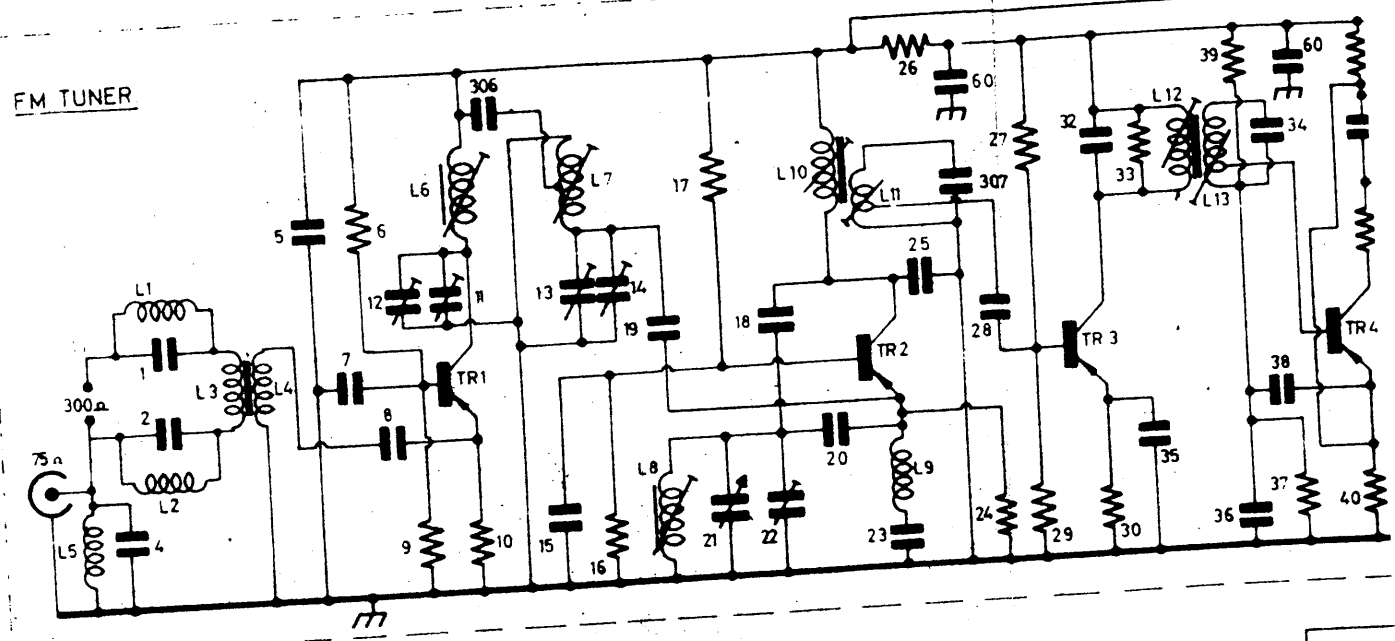
Z.17 POWER SUPPLY



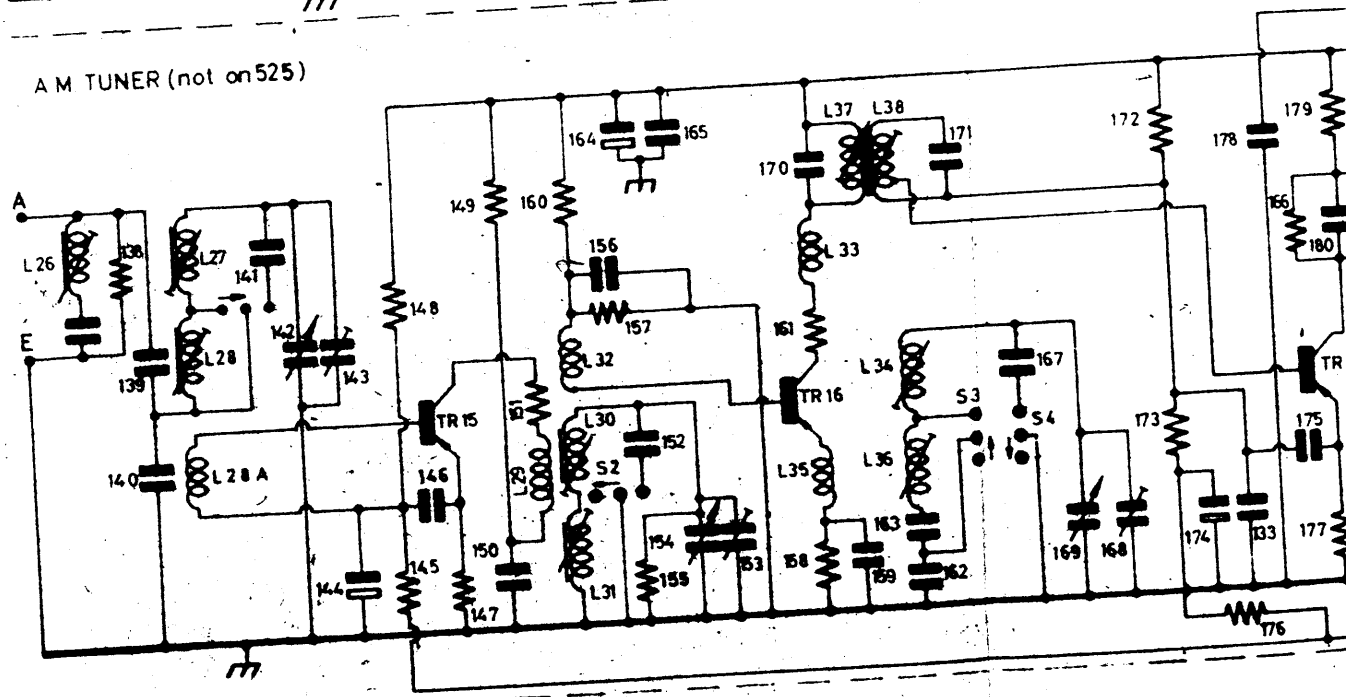
A.14 POWER AMPLIFIER



FM TUNER

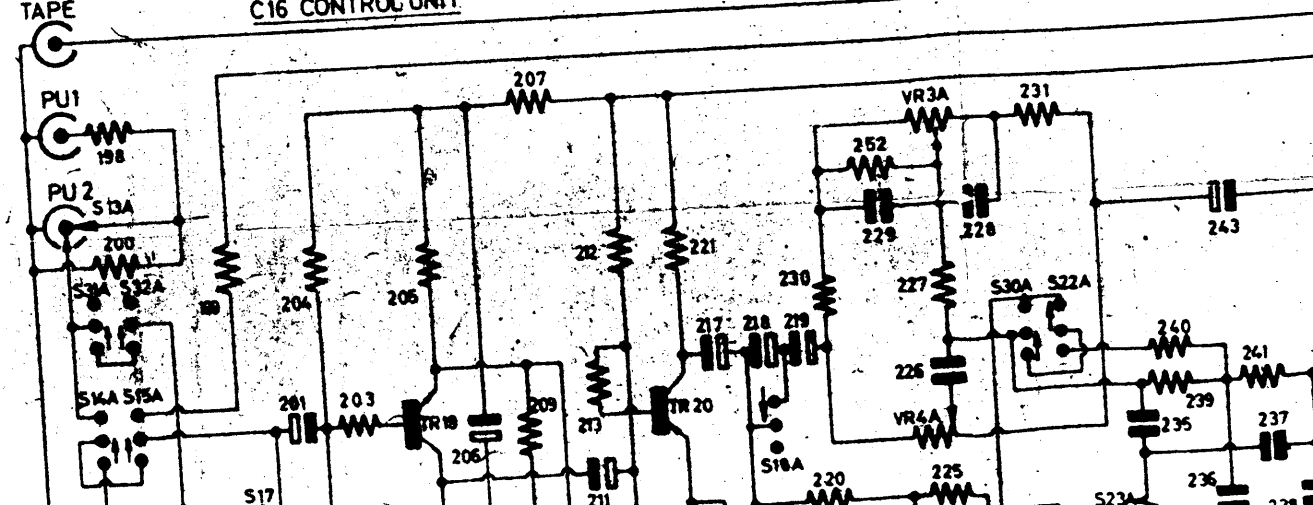


A M TUNER (not on 525)

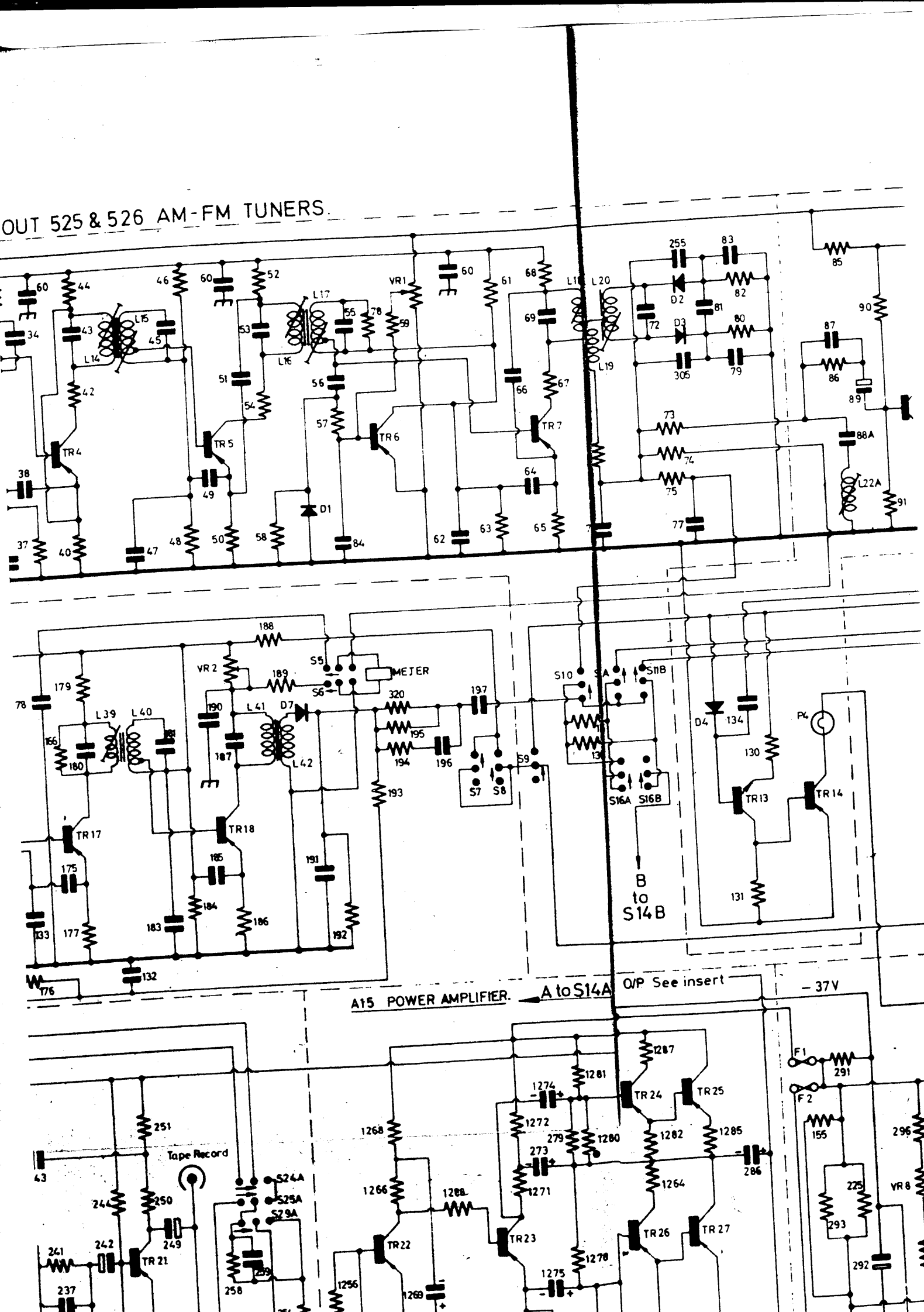


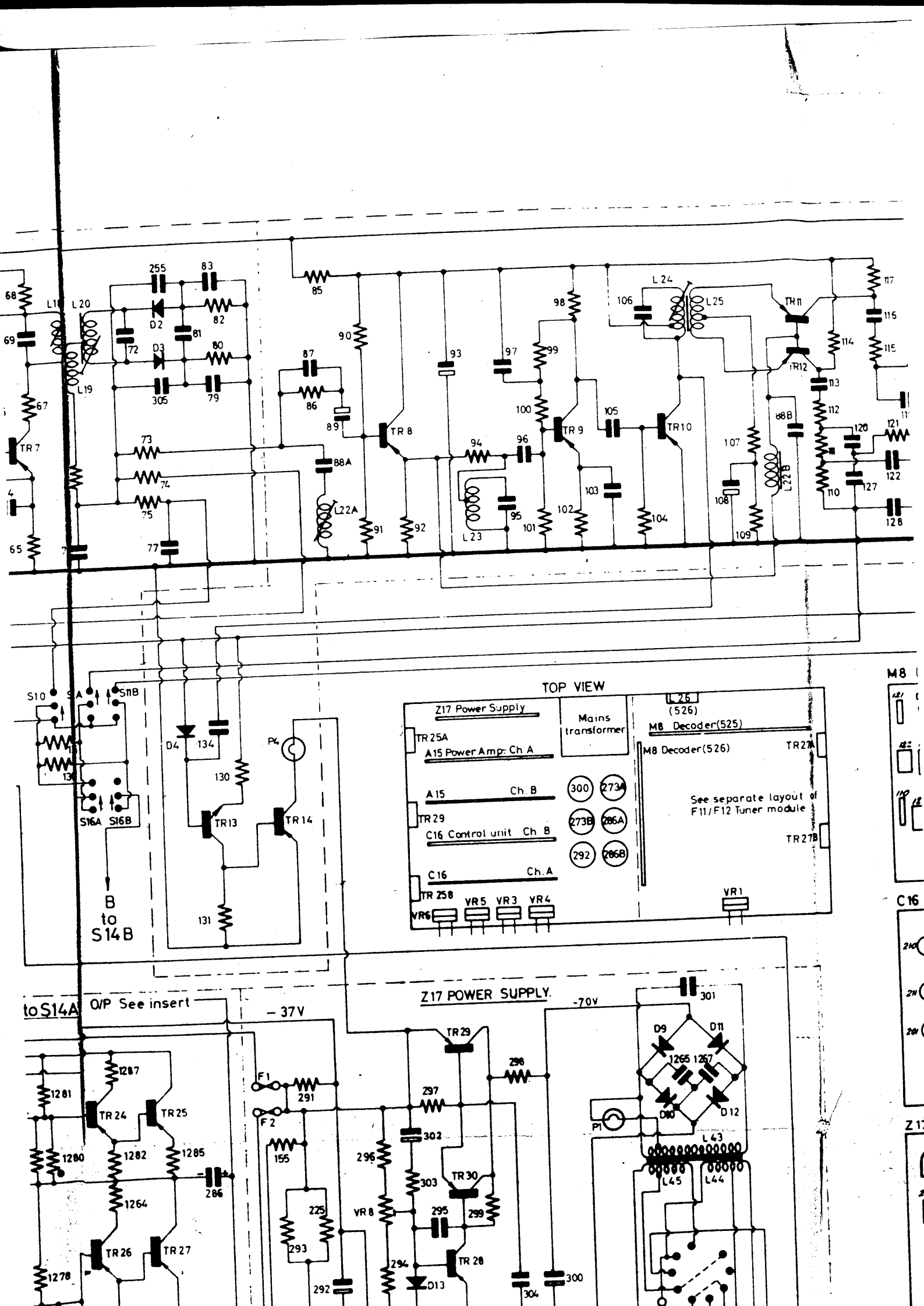
TAPE

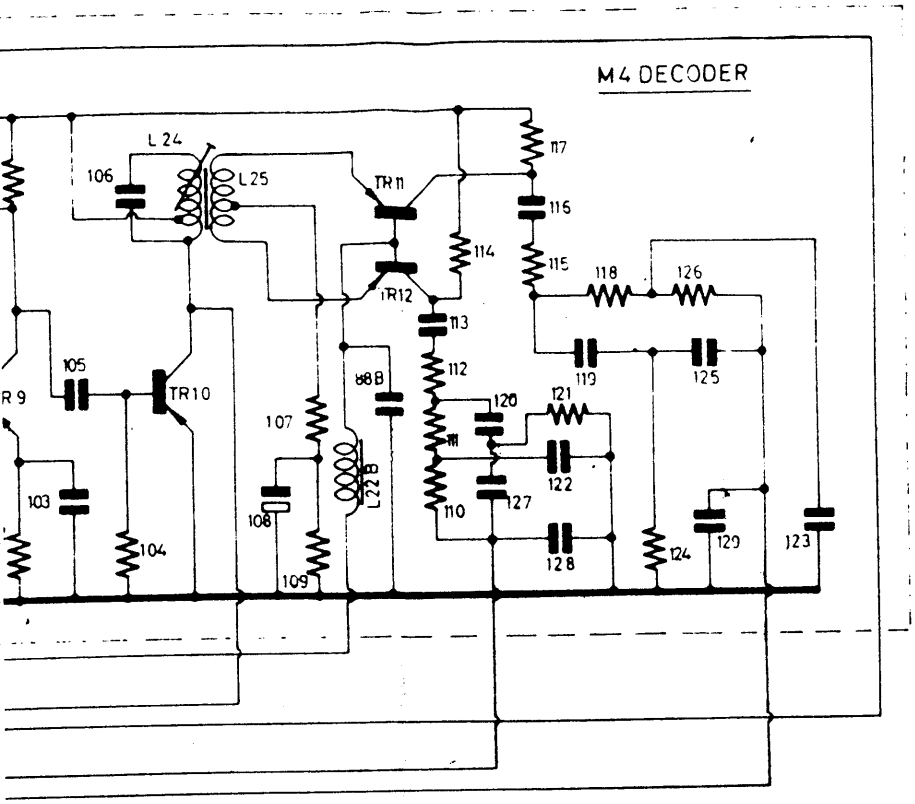
C16 CONTROL UNIT

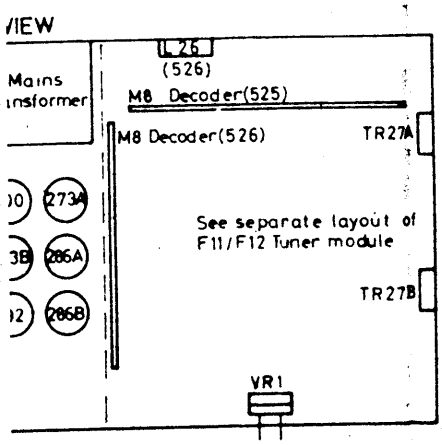


OUT 525 & 526 AM-FM TUNERS.

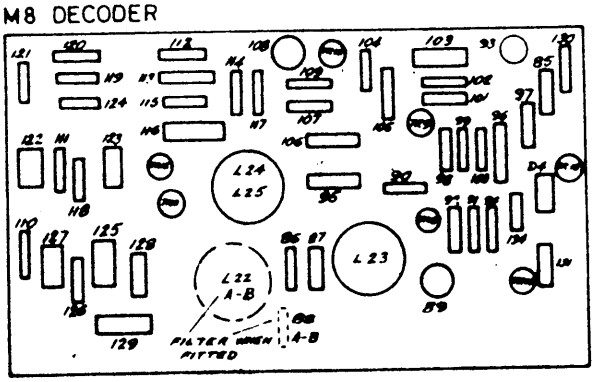



TOP VIEW
Z17 Power Supply
Mains transformer
TR25A
A15 Power Amp: Ch A
A15 Ch. B
TR29
C16 Control unit Ch B
C16 Ch. A
TR25B
VR6
VR5
VR3
VR4
VR1
L26 (526)
M8 Decoder(525)
M8 Decoder(526)
TR27A
TR27B
See separate layout of F11/F12 Tuner module
Z17 POWER SUPPLY.
-37V
-70V
O/P See insert
to S14A
B to S14B
S10
S14A
S14B
S16A
S16B
TR7
TR8
TR9
TR10
TR11
TR12
TR13
TR14
TR24
TR25
TR26
TR27
TR28
TR29
TR30
L19
L20
L22A
L22B
L23
L24
L25
L43
L44
L45
D2
D3
D4
D9
D10
D11
D12
D13
P1
P4
F1
F2
VR8

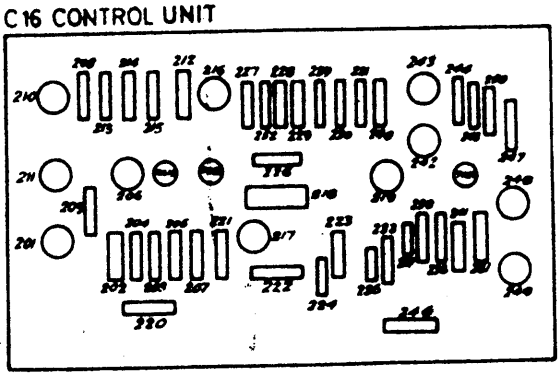


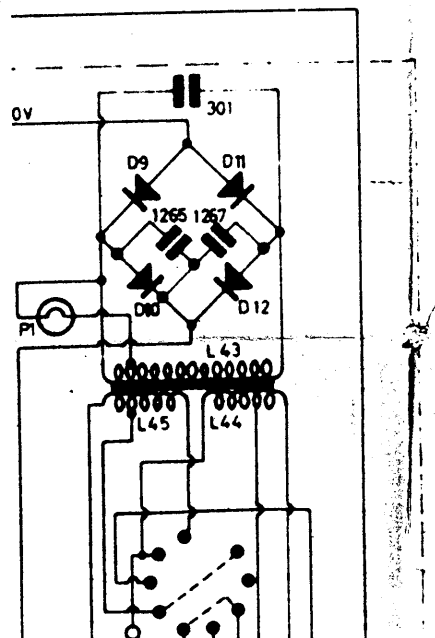


M8 DECODER

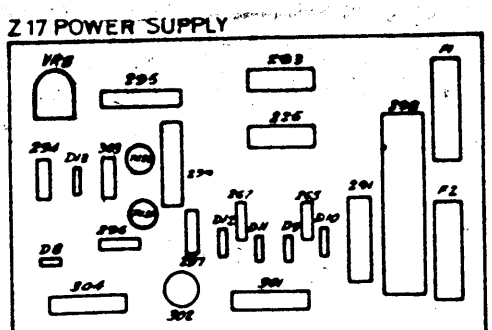


C16 CONTROL UNIT

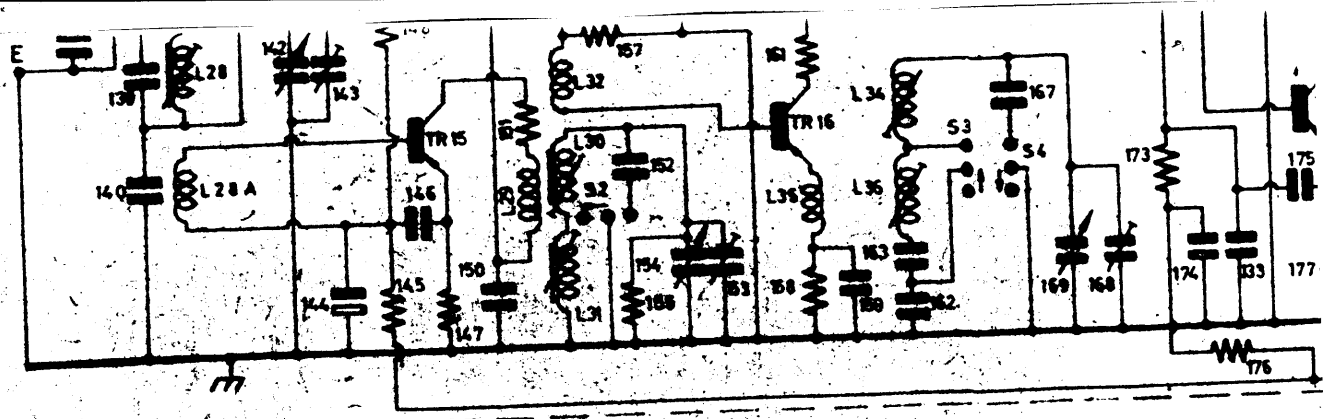


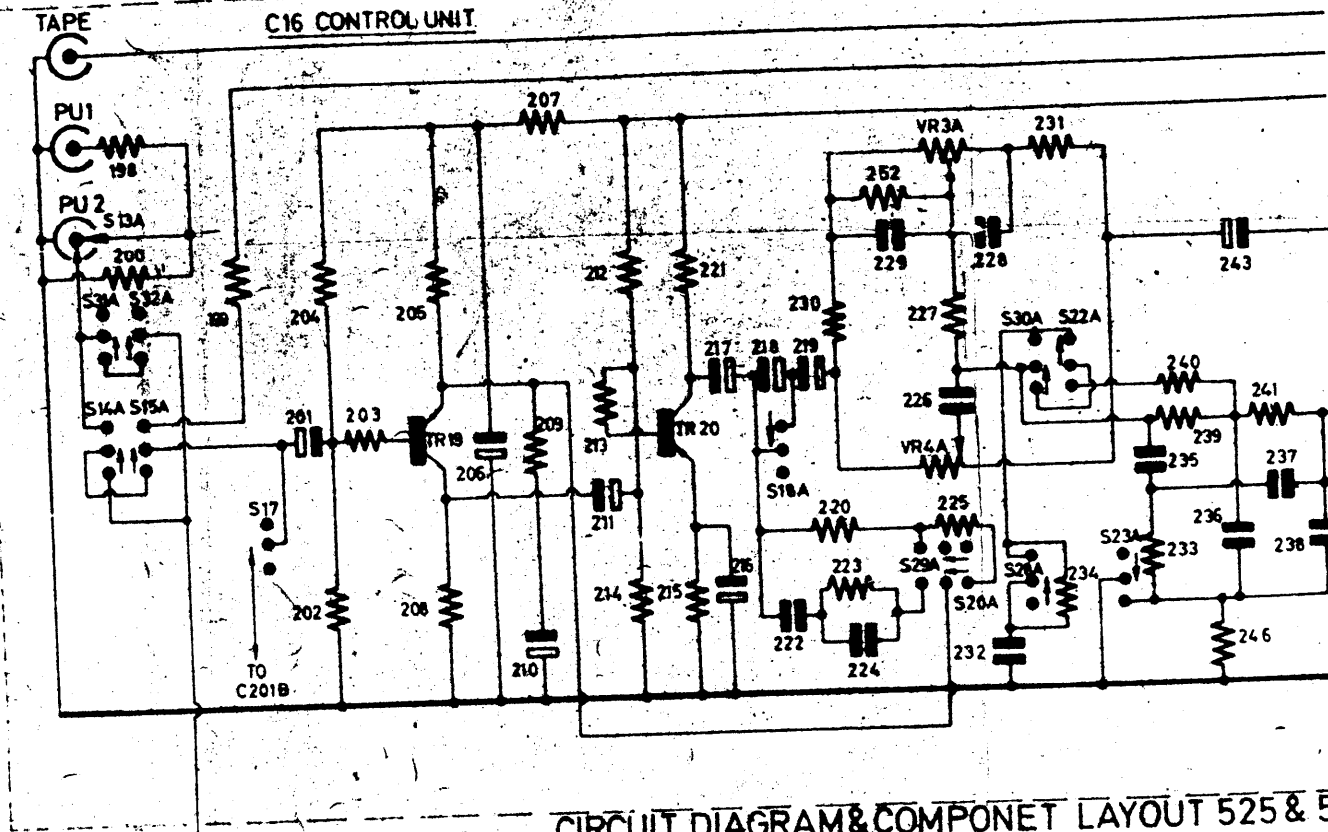


Z17 POWER SUPPLY



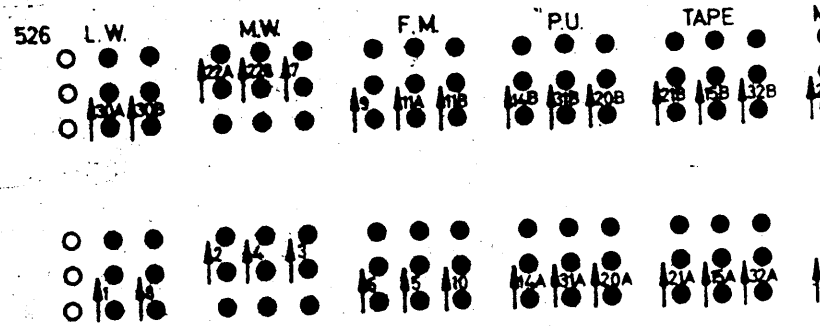
Note
R155 is mounted below Z17 on underside of edge connector socket



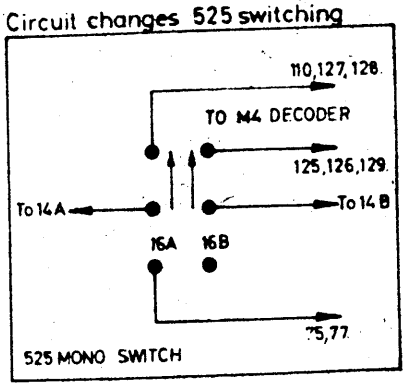


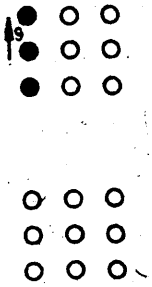
CIRCUIT DIAGRAM & COMPONET LAYOUT 525 & 5

PUSH-BUT

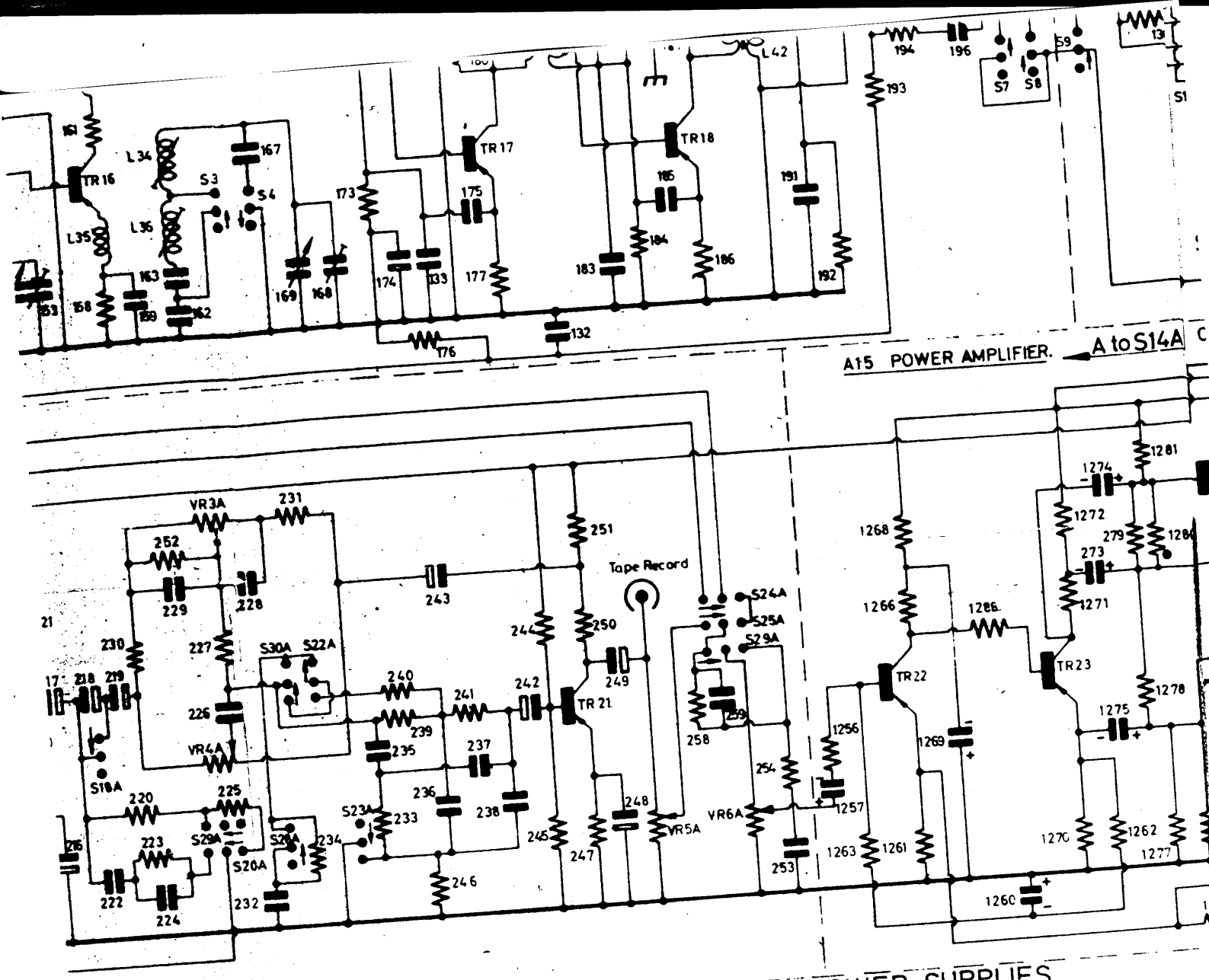


Circuit changes 525 switching

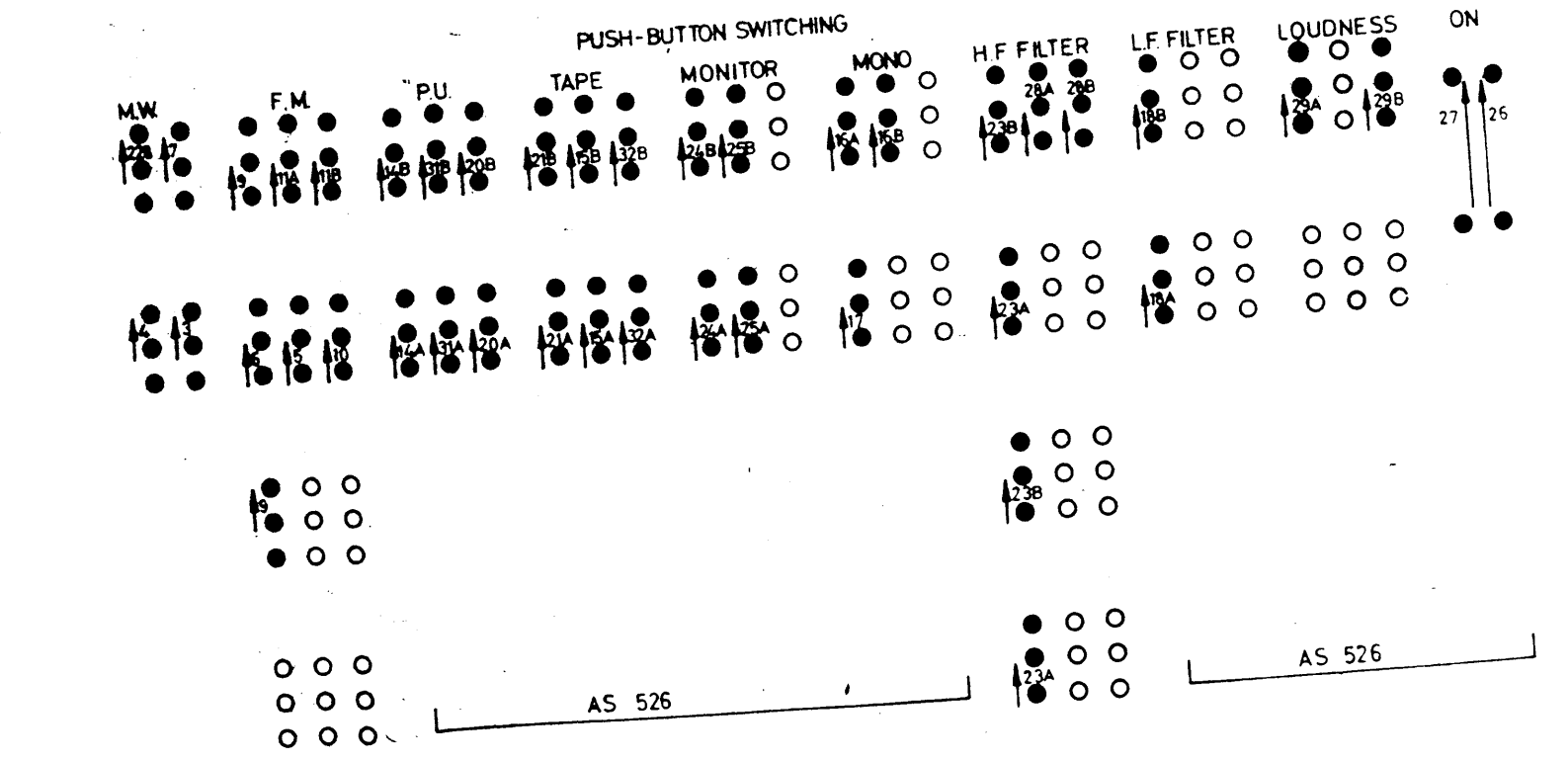


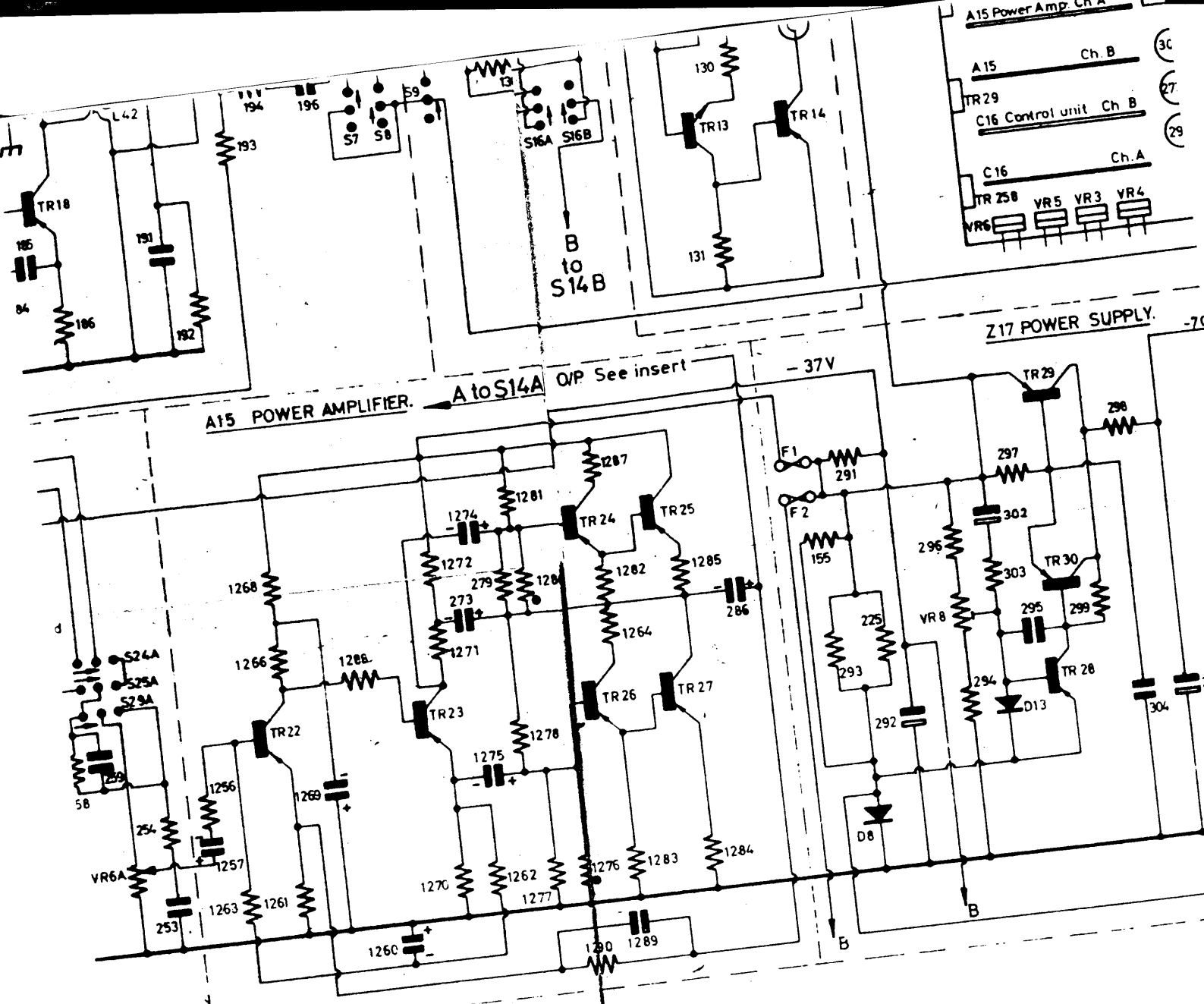


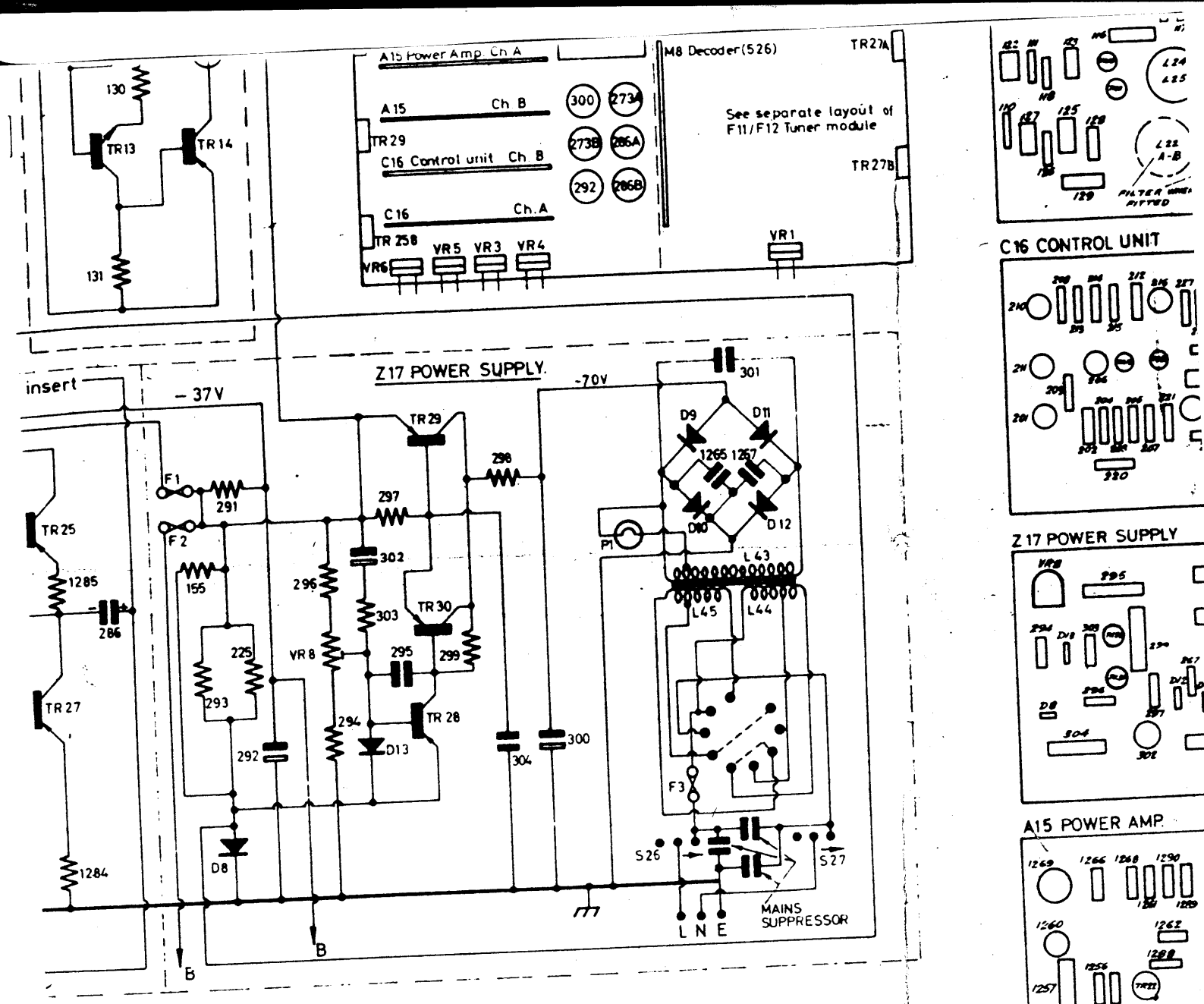
AS 526



AGRAM & COMPONET LAYOUT 525 & 526 AUDIO SECTION & POWER SUPPLIES.




A15 Power Amp. Ch A
A15 Ch. B
TR29
C16 Control unit Ch B
C16 Ch. A
TR25B VR5 VR3 VR4
VR6
L42
193
194
196
S7 S8
59
13
S16A S16B
B to S14B
130
TR13
TR14
131
TR18
185
84
186
191
192
A15 POWER AMPLIFIER.
A to S14A O/P See insert
-37V
Z17 POWER SUPPLY.
TR29
298
297
F1
291
F2
302
155
296
303
TR30
225
VR8
295
299
293
294
TR28
D13
292
304
D8
1287
1281
TR24
TR25
1274
1272
1282
1285
286
1268
279
1280
273
1271
1264
1266
1288
TR26
TR27
TR23
TR22
1278
1275
S24A
S25A
S29A
259
58
254
1256
1269
VR6A
1257
253
1263
1261
1270
1262
1277
1276
1283
1284
1260
1290
1289
B
TION & POWER SUPPLIES.
NOTE
Circuit diagram
channel 'B' is du
TO 286 B/
L S CH B S30b 305B
L S CH A S30A 305A
TO 286A/287A
HEADPHONE OUTPU
H.F FILTER
L.F. FILTER
LOUDNESS
ON
28A 28B
23B
18B
29A 29B
27 26
23A
18A
23B
23A
AS 526
FIG.1
FIG.2
FIG. 3
M8 ALIGNMENT
(SEE ALIGNMENT INSTRUCTIONS)
DRIVE CORD ARRANGEMENT
2 Turns round spindle
Length of cord - 30"
TRANSISTOR CONNE
COLLECTOR (case)
base
emitter
collector
AC 191
AC 139
AC 142
AT 210
AL 102



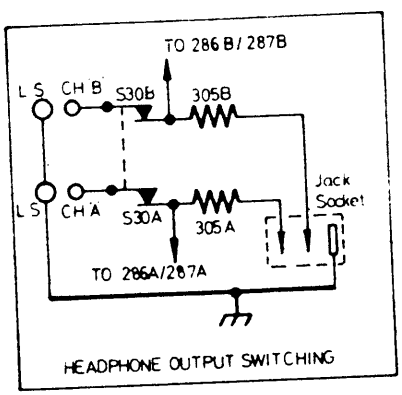
NOTE

Circuit diagram shows channel 'A' only, channel 'B' is duplicated exactly

FIG. 2 FIG. 3

18 ALIGNMENT

IGNMENT INSTRUCTIONS)



HEADPHONE OUTPUT SWITCHING

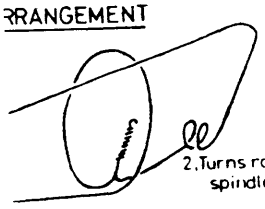
F11 AM/FM TUNER & F.12 FM TUNER

AM

NUMBER SHOWN AT TOP OF EACH COIL IS TOP SLUG AND NUMBER SHOWN AT BOTTOM IS BOTTOM SLUG.

FM

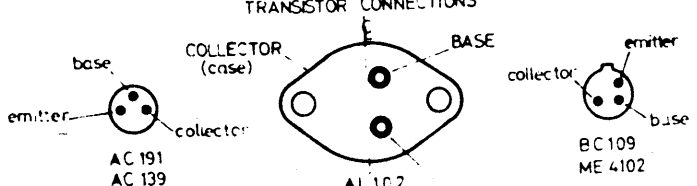
RRANGEMENT



2. Turns round spindle

ind - 30°

TRANSISTOR CONNECTIONS



THIS FM SEC

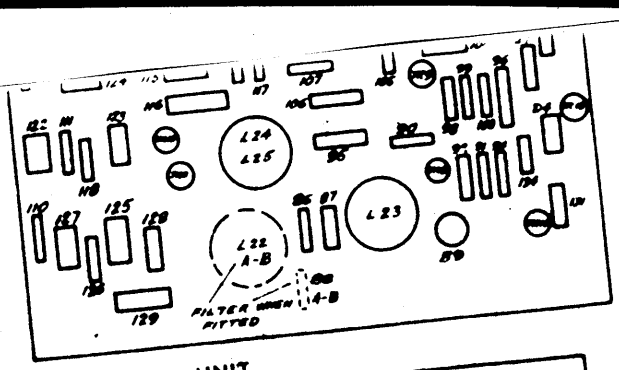
M8 Decoder(526)

TR27A

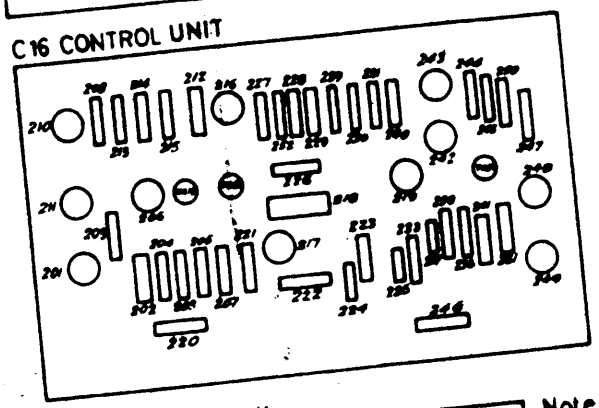
See separate layout of F11/F12 Tuner module

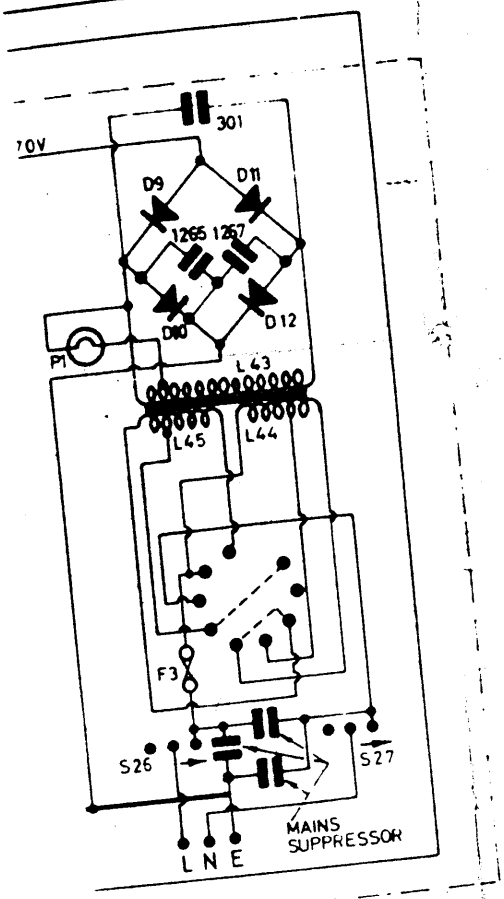
TR27B

VR1

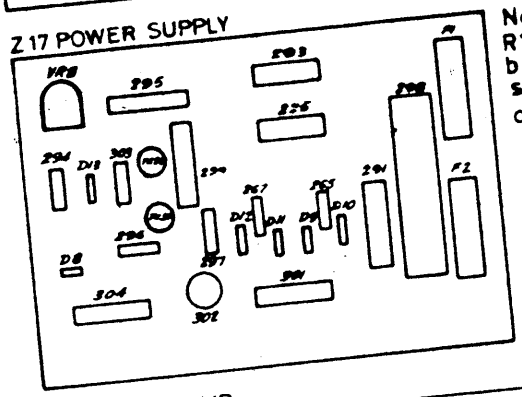


C16 CONTROL UNIT



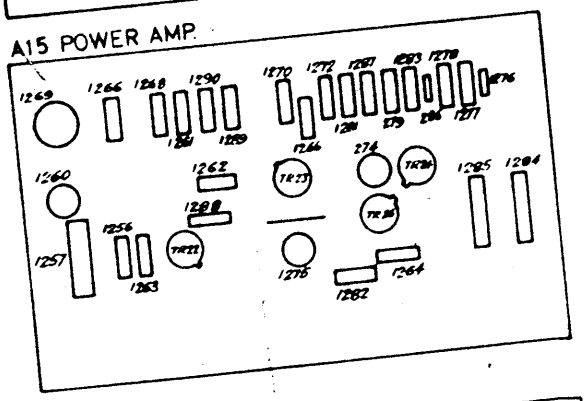


Z17 POWER SUPPLY



Note
R155 is mounted below Z17 on underside of edge connector socket

A15 POWER AMP.



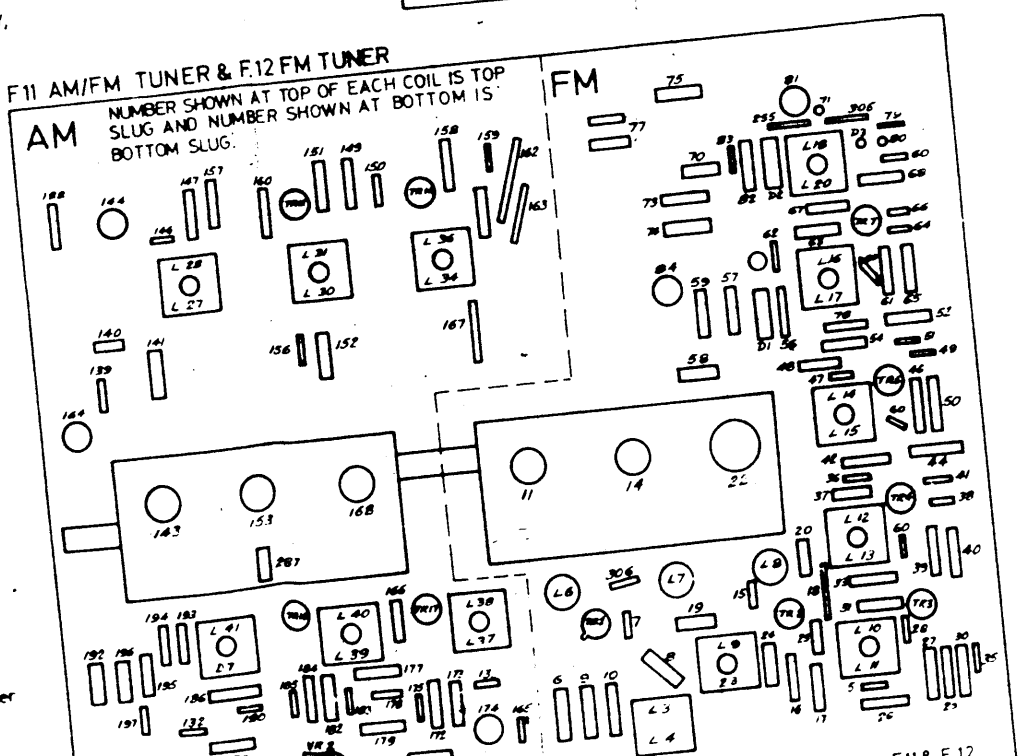
annel 'A' only,
exactly

F11 AM/FM TUNER & F12 FM TUNER

AM

NUMBER SHOWN AT TOP OF EACH COIL IS TOP SLUG AND NUMBER SHOWN AT BOTTOM IS BOTTOM SLUG.

FM



emitter